THE JOURNAL

of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 152, NO. 14 — CHICAGO, ILLINOIS — AUGUST 1, 1953

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PRECORDIAL NOISES HEARD AT A DISTANCE FROM THE CHEST

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In giving the Roger Morris Memorial address my topic should have some bearing on the medical philosophies and arts so notably embellished by Dr. Morris. I must add they have been abetted admirably by his successor, Dr. Blankenhorn. Stemming from the Oslerian tradition, which in turn was derived from continental and British sources, Roger Morris sought perfection in interpretation of signs and symptoms as revealed to the clinically sharpened senses. My discussion this evening will develop a theme in the area of physical signs where the humblest physician should be able to hold his own.

Medicine is at times fearfully serious and often gloomy, but the teaching and practice of medicine have their lighter moments and their amusing experiences, and we should make the most of them. Dealing with a topic in which physical diagnosis is the theme, it is appropriate that it fits in well with the extravagant American tendency to exaggerate; for here we have indeed the Paul Bunyan of physical signs, one which, defying the ordinary strait limits of the human frame, becomes at once a caricature and a giant. It magnifies itself in fact in the way we often tend to magnify by exaggeration after the fact.

My interest in precordial noises that can be heard with the unaided ear at a distance from the chest began in 1938, appropriately enough on Dr. Blankenhorn's service at the General Hospital, when I accidentally produced such a noise in a patient in congestive heart failure whose left lung was punctured during what had begun as an ordinary thoracentesis. When I visited him again several hours later, he had been alarmed by a noise "like a paddle wheel makes on the river," which he could hear and "feel." This simile and others likening the noise to "the grinding of gears," "the rustling of leaves," and "crunching up newspapers" are a pleasant tribute to the fertility of folk speechways. When the room was quiet, the sounds were barely audible at the foot of the bed. They could be heard clearly 2 ft. away. The sounds were synchronous with the cardiac systole. Left-sided pneumothorax was demonstrated by physical signs and roentgenograms, but no subcutaneous or mediastinal emphysema was found. The loud crackling noises (Hamman's sign) hurt the ears when the stethoscope was applied to the precordium. All abnormal sounds had disappeared in two days, and the patient made an uneventful recovery. Dr. Blankenhorn then told me of his considerable but unpublished experience with pericardial knock in World War I. This chance occurrence became "a burr that sticks in the memory," because of its close temporal association with two cases of interstitial emphysema of the lung that Johnson McGuire and I published soon after Hamman had aroused interest in the dramatic clinical features of the spontaneous form of this disorder. Another circumstance that gave my interest a wider sweep was a casual comment in Osler's essay on Sir Thomas Browne, in which he quoted from a letter about a "Woeman or mayd in Suffolk who had a julking and fluctuation in her chest . . . heard by the standers by," although this proved to be pyopneumothorax and a succussion splash.

Since these events focused my attention on noises heard at a distance from the chest, I have been on the lookout for other examples. This interest has been rewarded by the finding of several cases. Medical reports of these and other kinds of unusual and alarming noises heard at a distance have been found under the most diverse titles in the most obscure places. No cumulative index gives a clue to this sign, and, although my reading has been wide, surely many cases have been missed. Although I conceived the notion that I would review all published cases and produce an all-inclusive work, this was impossible without an "encyclopedantic" approach, time consuming beyond all reason. Most of the types of lesions and disordered functions that give rise to such sounds will be considered. While presentation of such miscellany may seem whimsical, it gives useful lessons in diagnosis, enabling the physician to give correct therapy, which may vary from reassuring the disturbed patient with mediastinal emphysema to aspirating air from the right ventricle of a heart churning with air embolism and thus saving a life.

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Bibliographic references to medical reports quoted in this article and a more extensive consideration of the entire problem appears in Monographs in Medicine, Series I (Bean, W. B., editor, Baltimore, Williams & Wilkins Company, 1952, pp. 22-65).

This paper is the Roger Morris Memorial Lecture for 1953, delivered March 3, 1953, at the Cincinnati College of Medicine, Cincinnati. A portion of this lecture was given before the Midwestern Regional Meeting of the American College of Physicians, Chicago, Nov. 22, 1952.

DEFINITION

The term "precordial noises or sounds audible at a distance from the chest" is used to imply unusual loudness (rather than overacute hearing) and to indicate that the heart's action is responsible. This excludes wheezes and pleural friction sounds and even ribs cracking with a loud sound. The quantitative aspects defy analysis, since the subjective element in hearing has not been measured. Although the noises discussed here often come from outside the heart and usually are produced by impingement of the heart on air or air and fluid in abnormal places, they may be produced within the heart as extremely loud murmurs or by intracardiac air. Alteration of structure or abnormality of function of the lungs, pleura, mediastinum, pericardium, alimentary canal, and heart causes such noises under peculiar and sometimes poorly understood circumstances.

HISTORICAL BACKGROUND

Ancient medical records contain no reference to sounds heard at a distance from the chest. The Bible has no precordial companion for the abdominal rumblings of Isaiah "whose bowels sound like an harp." There is no thoracic counterpart of the borborygmal chorus of Aristophanes' "Clouds." In the posthumous works of Robert Hooke, written just 250 years ago, are these prophetic words: "Who knows but that one may discover the works performed in the several offices and shops of a man's body by the sounds they make, and thereby discover what instrument or engine is out of order!" Only with the perfection of the art and science of physical diagnosis was an interest in pulmonary and cardiac sounds and noises developed sufficiently to record cases of trouble in the engines and instruments of man's chest. Almost every kind of condition capable of producing such noises was identified during the resurgence of physical diagnosis in the 19th century, with contributions about evenly divided among French, British, and German clinicians. Experimentally many types of noises have been produced by a number of investigators, whose widely scattered work has not been gathered for review.

CHEST AND MEDIASTINUM

Pneumothorax.—Sounds heard at a distance from the chest have been described in left-sided pneumothorax, the spontaneous, therapeutic, and traumatic varieties. An open chest wound increases the likelihood of such noises occurring after injury. This sign is well known among clinicians familiar with therapeutic pneumothorax for tuberculosis. Indeed the act of inducing pneumothorax on the left side may cause unusual noises that are heard by the patient, attendants, and physicians. A division of cases has been made on the basis of the source of air in the thoracic cavity:

Traumatic Pneumothorax: It is by no means clear that some cases discussed under hydropneumothorax, notably those of Bricheteau in 1844, are not actually cases of traumatic pneumothorax or pneumomediastinum rather than pneumopericardium, which he diagnosed. Furthermore, it is likely that some of the German cases of frightening *Mühlengeraüsch*, which are attributed to air embolism, belong in the category of traumatic pneumothorax or mediastinal emphysema. Morel-Lavallée, in 1864, reported the case of a 27-year-old coach driver who was run over by a carriage. His chest was bruised and several ribs were broken. Subcutaneous emphysema was noted. The *bruit de moulin* was heard everywhere near the bed. This noise of the mill is a happy simile, since the combination of water splashing rhythmically and a background sound of wooden machinery and running water is elegantly reproduced in miniature by the sound of pneumopericardium or pericardial knock, as anyone knows who has listened to both. The sound lasted for five days and was so troublesome at night that the man could scarcely sleep. In due course the cure was complete. Although Morel-Lavallée thought the cause of the trouble was perforation of the pericardium, traumatic pneumothorax or mediastinal emphysema seems more probable.

The havoc of World War I was not without its small and casual by-product of clinical observations on the sound that was given the prosaic but accurate title of pericardial knock. The note of Captains Rees and Hughes in the *Lancet*, January, 1918, classic in its brevity and clarity, deserves quotation in full:

> We should like to call attention to loud "tapping" sounds which we have heard over the cardiac area in nine cases of wounds penetrating the left chest, where the missile had lodged near the heart, or where the track of the missile has passed in its close proximity. These sounds were quite distinctive and similar in each case, only varying in intensity. They were most marked when the patient was first examined after wounding and persisted for a variable time, occasionally for only 24 hours, but in one patient they were still present on evacuation a fortnight later. The sound continued even when the breath was held, although the intensity varied with respiration, increasing during inspiration and diminishing during expiration in all cases. It was sychronous with the heart beats, and when loud rendered the heart sounds inaudible. In four patients the sound could be heard with the ear held some inches away from the chest, and the patients were even conscious of it. The sound had no resemblance to pericardial friction, and in the cases referred to there was no suspicion of any gas being present in the pericardium, which has been described as giving rise to very extraordinary noises.

Henley Munden, bringing up the chance of sport and the risks of rabbiting, reported the following case:

> I was called to see a boy who had been accidentally shot in the head and left side of the chest when rabbiting. About an hour before he died a loud cardiac "click" developed which was synchronous with the heart systole and could be heard distinctly six or eight feet away. It bore no relation to the respiratory movements, as the respiration was Cheyne-Stokes in character and the sound persisted during the period of apnoea. The . . . click in the ear-piece of a telephone when the lever is raised illustrates it very well. During the last fifteen minutes of life the heart became very feeble and irregular and the "click" disappeared. I was very interested to read [an] explanation of the phenomenon, as I was quite unable to account for it. A postmortem examination was not ordered by the coroner, so no further investigation could be made.

Spontaneous and Induced Pneumothorax: I cannot find with certainty the earliest recorded case of sounds produced by pneumothorax. Perhaps the first is that of Cornils in 1885, who reported loud noises produced by the heart in a 23-year-old man with pulmonary tuberculosis and left pneumothorax. They were heard several times by persons some distance from the patient. Autopsy revealed left-sided pneumothorax and advanced tuberculosis. There is little doubt that previous experience with

Mühlengeraüsch, the mill wheel noise of an earlier day, and its production by air embolism misled some German physicians into supposing that pneumothorax somehow caused air embolism and thus produced the loud and distantly heard sounds. I found another case published by Wolferth and Wood, in 1930, under the unlikely title of angina pectoris. In discussing the problem of pain in the chest they described a young University of Pennsylvania student who, in the throes of preparing for examinations, experienced pain over the heart. It was paroxysmal and became worse on exercise. It was supposed that a wrestling bout a week before might have precipitated the small pneumothorax on the left side found on roentgenograms. On running he had noticed "a sensation as though his heart were 'flopping around loose' inside of him," and "five days before, his roommate, while across the room, had heard his heart beating." The heart sounds, clear in the erect position, were not heard when he assumed the recumbent position.

Scadding and Wood recorded a number of cases in 1939. The first was that of a 26-year-old man who had a twinge behind the left shoulder blade. "Four days later, on first waking in the morning, he noted a 'curious bumping sensation' in the chest, accompanied by a faint sound." This was verified by the authors, who found a slight pneumothorax on the left side by roentgenographic examination. The sounds were heard only in the recumbent position. The second patient, a lad of 17 years, "complained of a heart beat on adopting a 'hunched up' posture; the noise could be heard by his mother a yard away." The sound could be heard off and on for 20 days. Roentgenograms showed the suspected partial left pneumothorax. The third case was that of a 19-year-old girl who had therapeutic pneumothorax on the left side for pulmonary tuberculosis. During induction, after 25 cc. of air had been injected, "a distinct click late in systole became audible in the region of the apex beat." It vanished when 150 cc. more were injected. On the next day, however, she had occasionally noted a clicking sensation in the precordium. Their last case, a retrospective and presumably autobiographical one, was that of a young man in perfect health who had "a sharp pain in the chest, and this was followed by an extremely loud peculiar noise accompanying the heart beat. The noise was so loud that it could be heard in the room below." Three weeks later it disappeared without complication, despite the diagnosis of rupture of a heart valve. This case, even allowing for the recollection of 20 years, holds the all-time record for loudness, as far as I have been able to ascertain. Frost and Bing described a 17-year-old youth in whom spontaneous pneumothorax developed on the left while bicycling. There was pain and breathlessness. "When the patient was placed on his left side there was a distinct extra sound which was now and again so loud that it was audible to the patient and even to other persons one meter away from him. The sound most resembled the clicking of the tongue used to urge on a horse."

Interstitial Emphysema of Lung and Mediastinum.—It is appropriate that Laennec, whose invention of the stethoscope opened the modern era of clinical observation of diseases of the chest, was the first to describe sounds heard at a distance in interstitial emphysema of the lung. Indeed he gave one of the earliest satisfactory descriptions of the lesion itself, noting "beads of bubbles along the pulmonary strands." He remarked that childbirth, weight lifting, and straining at stool were likely causes. In addition to the dry crepitant rhonchus with large bubbles, he observed subcutaneous emphysema. He said, "The patients are sometimes sensible of a kind of crackling in the part affected." This statement is the earliest record of sounds audible at a distance. Although Skoda confirmed these observations and Müller emphasized them, neither described sounds heard at a distance. There are undoubtedly other early cases on record, but the contemporary scene with its numerous papers had its curtain raising in Hamman's rediscovery of the clinical characteristics of interstitial emphysema of the lung. He gave the first description of apparently spontaneous episodes and so vivid a discussion of the subject that it at once caught the fancy of physicians. I should mention my good fortune in having seen one of his patients when an intern at Johns Hopkins Hospital. Excerpts from his papers include the following cases in which noises were heard at a distance from the chest:

> A 51-year-old physician had pain in the chest while shaving. On the evening of the next day while "lying upon his left side, he heard a curious loud, bubbling sound with each contraction of the heart. His wife sitting upon the bed beside him could hear it very plainly."
>
> A young physician, aged 25, had a sudden pain in the left side of the chest and a peculiar crackling sensation in the region of the heart. A few hours later "as he was leaning upon his desk he suddenly heard a curious crackling noise, apparently coming from that part of the chest where the pain was located. . . . It could be heard when the bare ear was held a foot from the chest wall."

It did not take long for reports of similar cases to be published. Morey and Sosman (1939) told of a husky medical student in whom a severe pain in the left upper precordial region suddenly developed while he was working in the laboratory. The pain radiated down his left arm and was different from pain associated with pneumothorax, which he had experienced previously. On the morning after the precordial pain began, he became conscious of a knocking and clicking in his chest. At times he could feel it, and at other times he could hear it. "Anyone standing directly in front of him could hear the noise." Somewhat later that year, McGuire and I reported two instances of spontaneous interstitial emphysema of the lung and described the patient already mentioned in the introduction. The first patient, a 17-year-old school girl, felt a pain in the chest while dribbling a basketball, went home, and went to bed. "Shortly afterwards she heard a curious noise in her chest and told her mother that she thought she had pleurisy." In the other patient, sounds were not heard at a distance.

Pinckney, in 1941, reported the remarkable case of a 24-year-old white woman who had six different attacks of spontaneous pneumothorax, in some of which there was interstitial emphysema. On her third attack she had dull pain and dyspnea. "She also noted a loud, clicking, snapping noise audible at all times no matter what position she assumed. In addition when lying on the left side she heard another sound, a crunching, crackling sound like small chicken bones being crushed. This sound she cannot say with certainty was synchronous with her heart beat. Both sounds were easily audible to persons in the

room with her." On her fourth attack three months later, pain developed while she was walking. Several hours afterward there was a loud clicking noise, and a crunching sound became audible. Roentgenograms showed a small pneumothorax on the left side. With her fifth attack 15 months later, she had only a heavy sensation. "Again the very loud clicking noise, synchronous with each heart beat, was easily audible to anyone within twenty or more feet, and slightly less audible was the crunching noise when she sat leaning forward on her left side." This lasted for six weeks, during which time her lung reexpanded. Pinckney reported another case, that of a 24-year-old man in whom severe pain developed while at rest. While lying down at bedtime on the third night after the onset of the pain, both the patient and his wife were startled and terrified to hear a loud clicking noise emanating from the region of the patient's heart, audible several feet away. It lasted only 24 hours and gradually subsided. The presumptive diagnosis was mediastinal emphysema. Miller reported the case of a 27-year-old resident physician at the Cincinnati General Hospital who had a sudden knife-like pain in the chest while making ward rounds. He was put to bed. A small left-sided pneumothorax was discovered. Two days after the painful attack, he had recurrence of sharp pains over the left precordium. "Soon after this he heard peculiar loud clicking noises in his chest synchronous with the heart beat. Palpation by the patient over the sternum revealed a thrill was present. The patient's wife who was standing five or six feet away from the bed was also able to hear these sounds." Greene reported the case of a 41-year-old Negro physician who, while sitting at his desk, had severe substernal pain, which radiated to the left shoulder. He went to bed immediately and noted that lying on his left side produced more pain and caused tapping, crunching, and bubbling sounds to come from the chest. These sounds were audible to his wife at the bedside and were synchronous with the heart beat. Later a roentgenogram of the chest revealed air in the anterior mediastinum.

During the pandemic of influenza in the latter part of World War I, many observers reported interstitial emphysema of the lung and pneumothorax complicating influenza and its attendant pulmonary sequelae. Although subcutaneous emphysema and pneumothorax were recognized, apparently no one described Hamman's sign or noises heard at a distance from the chest. Mediastinal emphysema and pneumothorax complicating parturition has been recorded as a not too rare complication. In the review of Gordon in 1927 and that of MacRae in 1949, no mention is made of sounds heard at a distance from the chest, although the characteristic noises heard by auscultation were described in many instances.

Traumatic Mediastinal Emphysema.—It is not always clear from descriptions whether certain traumatic cases in which precordial noises were heard at a distance from the chest should be put in the category of mediastinal emphysema or pneumothorax or both. Steiger, in 1864, described a man who fell, fracturing his arms, shoulders, and ribs. He had marked precordial tympany, and a splashing, metallic sound synchronous with the heart beat was heard at a distance from the chest. Since this patient recovered it is not known whether he had pneumothorax, pneumomediastinum, or mediastinal emphysema, but in all probability his case represents the same type in which pericardial knock is heard. In 1875, Leonspacher described precordial tympany and musical heart sounds heard 3 ft. from the bed in a man who had fallen on his back. He, too, recovered, and the exact nature of the lesions was not known. Weil recorded an instance of mediastinal emphysema in a young man who was given an injection of procaine into the brachial plexus, in whom sounds were heard at a distance for a few minutes. Jehn in 1921 described an 18-year-old boy who fractured his larynx. Sounds synchronous with systole and diastole were heard at a distance from the chest. After death, air as well as pus was found in the mediastinum.

ALIMENTARY CANAL

Rupture of the Esophagus.—In 1722, Boerhaave reported the first case of rupture of the esophagus. "We have the surprising observation which is perhaps the only one published, namely the illustrious Baron Wassenaer, Lord High Admiral to the Republic, after intense straining and vomiting broke asunder the tube of the esophagus near the diaphragm so that after the most excruciating pains the aliments which he swallowed passed, together with the air, into the cavity of the thorax, and he expired in 24 hours." Unfortunately, there is no comment on any sounds heard at a distance from the chest. In a number of recent reviews that have emphasized the importance of diagnosing rupture of the esophagus because of the possibility of surgical relief of the condition, there is no comment on noises heard at a distance from the chest. As far as I have been able to find, the only clearly demonstrated case was that of Begbie, published in 1863, in which he described a patient with carcinoma of the esophagus which ruptured into the pericardium, and splashing and churning sounds were heard at a distance from the chest.

Ectopic Borborygmi. — Portions of the esophagus, stomach, and colon may contain trapped air, which produces sounds heard at a distance, with the heart beat providing the percussion force. At times the pulse can be counted from such sounds, although there are apt to be variations produced by respiration, changes in position, and belching or expulsion of flatus. A unique case of precordial noises reported in a brief note published by Allen is quoted in full:

> A woman came for examination complaining of "heart trouble" of unusual nature. She had been disturbed by a noise synchronous with the heart beat which had appeared intermittently for two years. It frequently bothered her during the day but was likely to be particularly troublesome when she was lying down at night. The sound was so loud that it was heard for a considerable distance from the body. Not only the patient but other people could hear it; the latter even before the patient entered the room. She described it as resembling the splashing of water in a mill. The cause of the noise was discovered more or less by accident. She had moderately severe anemia which had not responded to treatment. X-ray examination of the gastrointestinal tract was made in order to see if there was any lesion responsible for loss of blood. It was found that she had a diaphragmatic hernia; the large part of the stomach was lying in the chest. The sound was produced through action of the beating heart on the contents of the intrathoracic stomach.

Greene, who has contributed notably to the study of such noises, described some curious observations. In one patient with a pneumothorax on the left side who was

being prepared for introduction of more air, a metallic, knocking sound began to emanate from the chest, audible at a distance of 3 ft. Several minutes later borborygmus was heard, and the sound disappeared without introduction of more air or changes in position. In this and another patient, introduction of air into the colon, sufficient to distend the splenic flexure again produced the noise with the metallic, knocking quality, sometimes heard in systole, sometimes in diastole. It was concluded that when heard in systole it was caused by rotation of the heart, which struck the diaphragm immediately above a bubble of gas in the colon, and that when heard in diastole it was caused by the free fling of the uncushioned heart striking the diaphragm.

HEART

Pneumopericardium.—Even before Laennec's observation, Morgagni spoke of having heard the splash of water and air in the pericardium, and Portal had encountered this combination at autopsy without recording clinical findings. The first real advance in this topic was the observation of Brichteau in 1844, who described a Polish veteran of Napoleon's army who was struck down by a blow on the chest with a carriage tongue. His wife heard "boiling" in his chest, and Brichteau and eight assistants all heard it. The man died, and autopsy disclosed pericarditis, with the profuse formation of evil-smelling gas. Stokes' (1855) observations speak for themselves:

> The patient was a young man of lymphatic temperament, who had laboured under an attack of acute pericarditis for a few days before I saw him. On my first examination he presented the usual signs of dry pericarditis, with a considerable effusion of lymph of the ordinary consistence. The rubbing sounds, though loud and distinct, had nothing unusual in their character, and the patient suffered but little distress. After two or three days I saw him again, and found that his state had become very much altered. His appearance was haggard and worn, and he complained of extreme exhaustion, which he attributed to a total deprivation of sleep. This was induced by the extraordinary loudness and singular character of the sounds proceeding from the cardiac region; for though up to this period the rubbing sounds were distinctly perceptible by means of the stethoscope, the patient was quite unconscious of their existence. They had suddenly, however, become so loud and singular, that the patient and his wife, who occupied the same apartment, were unable to obtain a moment's repose. On examination, a series of sounds was observable which I had never before met with. It is difficult or impossible to convey in words any idea of the extraordinary phenomena then presented. They were not the rasping sounds of indurated lymph, or the leather creak of Collin, nor those proceeding from pericarditis with valvular murmur, but a mixture of the various attrition murmurs with a large crepitating and gurgling sound, while to all these phenomena was added a distinct metallic character, and I could form no conclusion but that the pericardium contained air in addition to an effusion of serum and coagulable lymph.

The most detailed and clear-cut study of the problem was reported by Morel-Lavallée, in 1864. After some shrewd speculation, he reports several cases. The first was that of a 20-year-old carpenter, previously healthy, who fell from the seventh floor, hit a projection on the fourth, and crashed to the ground. Shock, fractured left leg, incomplete paraplegia, and hematuria ensued. On the next day the man said that during the night he had been awakened several times by a noise coming from the left side of the chest resembling that produced by blowing into a wide bottle. It lasted seven days and was never heard in a sitting position. He died suddenly while trying to sit up on his bed. Autopsy showed multiple ruptures of the pericardium, with air in it, slight pneumothorax, and communication between pericardium and pleura. Two kinds of noise were heard, one the mill wheel sound and one a kind of metallic tinkle. Another patient, a 45-year-old coachman, had fallen beneath a horse, which stepped on his chest. A bruise the size of the hand was found over the sternum. Bony crepitus was detected. After a stormy course, precordial sounds increased in intensity and were heard 1 m. from the chest. Autopsy revealed widespread sepsis, with traumatic pyopneumopericardium.

Walshe recorded the melancholy accident of a careless sword swallower, who pierced his pericardium through the gullet and had a noisy pneumopericardium with unadvertised sound effects. James, in 1904, made an extensive survey, which included most of the previously reported cases along with a case report of his own. In a 25-year-old Irish woman pneumopericardium developed as a sequel to injury of the esophagus from a fragment of mutton bone. The pertinent observations were as follows:

> When the patient takes a full breath and holds it there is heard by the listening ear, held twelve inches from the chest wall, a peculiar clicking sound synchronous with cardiac systole; this click has a musical quality with the quality of a succussion sound or splash. The first sound is accompanied by a loud metallic tinkle of splashing, gurgling quality, suggesting the sound made by an old-fashioned overshot waterwheel, the *bruit de la roue hydraulique.* It is as if a very marked succussion were brought out by each systolic contraction of the heart, together with many metallic tinkles. . . Its intensity varies from time to time without apparent reason.

Air Embolism.—It is not surprising that air embolism is a subject about which there is much rumor and general discussion and relatively few case reports, since air embolism indicates an accident. Durant, Long, and Oppenheimer discussed this problem in their article on pulmonary air embolism and stated, "In the pulmonary or venous form the presence of air in the right ventricle produces a loud churning sound often readily heard without stethoscopic aid which is known as the mill-wheel murmur. This murmur appears almost immediately after air has entered the venous circulation." In 1950, Stallworth, Martin, and Postlethwait described a patient in whom air embolism developed as a consequence of an operation or infusion of blood during deep shock, and the characteristic sound was described as a mill wheel murmur. Although it was not explicitly stated that this was audible at a distance from the chest, a letter from Dr. Stallworth mentions that, once it had been heard with the stethoscope, close attention permitted the observers to hear it without the stethoscope.

Heart Murmurs.—Before the introduction of the stethoscope focused the clinician's attention on sounds produced by the heart, there were references to audible precordial sounds found in conjunction with heart disease. Some of these are described so vaguely that they are of little value. Others probably merit inclusion in what has now become a formidable list of endocardial murmurs heard at a distance by the unaided ear. Allan Burns described a patient seen by Dr. Brown in the Edinburgh

Hospital, a man with dropsy who had "a jarring when the ventricles contracted; and when the hand was laid on the side it resembled the feeling of a varicose aneurysm; his expectoration when he used exercise was bloody; he had unusual palpitation, jarring sensation and hissing noise, as of several currents meeting; the sound was frequently audible as in the varicose aneurysm." Mitral stenosis, pericarditis, and induration of liver and lungs were found after death. Burns referred to the phenomenon as "audible palpitation," and the presumption is strong that the sound was heard at a distance, although it is not explicitly so stated.

Laennec had given this matter detailed study, and his observations are so unusual that they must be ascribed to marvelous acuity of hearing or to his having been carried away by rhetorical enthusiasm. The following quotation is from Forbes' translation:

> It had long been believed, but rather on the faith of traditional report than from actual observation, that the pulsations of the heart may be sometimes heard at a certain distance from the patient. Corvisart informs us that he had observed this fact but once, and only then on placing the ear very near the chest. Many years since, I was informed by several patients, that they were subject to palpitations of such severity that they could be heard at the distance of several paces; and one of these patients, as well as persons of credibility, witnesses of the fact, assured me that in his case the palpitations, could be heard in the chamber adjoining that in which he slept. I observed this phenomenon for the first time in the year 1823, in the case of a young woman; and having since then paid particular attention to the circumstance, I am convinced that although it is very uncommon to meet with it in so great a degree as that just mentioned, it is very common to find it in a less degree, such, namely, as to be heard at a distance of from two to ten inches from the chest. Several of my colleagues, to whom I had mentioned the fact, have likewise noticed it several times since; and M. Lerminier, among others, was kind enough to send to my Clinic, in 1824, two patients in whom it was perceptible in a very considerable degree. In no case have I myself heard the pulsation at a greater distance than a foot and a half or two feet; but we can readily admit the possibility of this. I have several times ascertained from the perfect accordance of the sound with the pulse, that it was owing to the contraction of the ventricles. I do not recollect to have ever heard it produced by the auricles. Out of more than twenty subjects in whom I have heard the pulsation at a distance of from two inches to two feet, three or four, at most, were affected with organic disease of the heart. All the rest labored under palpitation of a purely nervous kind. . . . Never having had an opportunity of examining the body of anyone who had presented this phenomenon, I cannot speak with any certainty as to the organic cause of it; but I am induced to consider it as owing to the presence of a greater or less quantity of air in the pericardium.

Such a distantly heard sound appeared in Laennec on his deathbed. Andral's commentary on this interpretation is worth including: "Laennec's explanations of these sounds of the heart heard at a distance, appears not to be sustained by fact. It is a mere supposition of his that gases in the cavities of the heart produce this phenomenon. The supposed analogical facts cited by him in support of his opinion, have no real analogy."

In the classical description of hyperthyroidism which has given him eponymic fame, Graves encountered the phenomenon of heart sounds heard at a distance: "In one the beating of the heart could be heard during the paroxysm at some distance from the bed, a phenomenon I had never before witnessed, and which strongly excited my attention and curiosity. [The patient], her friends, and Dr. Harvey all testified the frequency of this occurrence, and said that the sound was at times much louder than when I examined the patient, and yet I could distinctly hear the heart beating when my ear was distant at least four feet from her chest!"

Stokes reported two instances of murmurs heard at a distance in "extensive and irregular ossification of the aortic orifice." The sounds were audible to the patients, and in one "perception of these sounds was the principal cause of his suffering for his general health long continued excellent, and the heart's action was but little excited. This gentleman once observed to me that his entire body was one humming-top. The loudness of the tone varied with the force of the heart. When I first saw him the sounds were audible at a distance of at least three feet, but when the force of the heart had been reduced . . . the loudness of the sound at the aortic orifice was so much reduced as to render it inaudible, unless by applying the ear." Humming was heard over the limbs, probably transmitted by bone.

Simpson described a 40-year-old man who, while helping to move a piano down a flight of stairs, "suddenly felt something give way in his chest, and immediately heard a noise proceeding from it, which he compared to that 'made by a young frog.' " It was audible to those about him as well as to him. It could be heard for nine months and then faded out. Four and a half years later he died of heart failure, having signs of free aortic regurgitation. The diagnosis of rupture of an aortic valve was made.

Frew and Finlayson related the distressing sequel to a brawl that befell a 39-year-old man. Although no blow was struck, there was much straining and struggling. There was a " 'cooing sound' in his chest resembling the soft cooing of doves. . . . This cooing sound was also heard so plainly by his wife that she complained of its disturbing her while in bed with him." It was heard readily 1 to 2 ft. away from the chest; and there were signs of aortic regurgitation. The sound could be heard for many months but was gone 19 months after the onset. He died in congestive failure 34 months after the accident.

In his classic study of rupture of the aortic valve, C. P. Howard described 21 cases in which the murmur was heard by the patient and his friends. This number represented about a third of the nontraumatic cases. The variations in loudness of the sound are illustrated by the following reports: Quain's case, heard several inches from the chest; O'Neill, 6 ft.; Dupuis, 15 to 20 cm.; Tranquilli, 50 cm.; Schneider, 25 cm.; and Schlecht, several centimeters. Along with other examples, the murmur was compared to the "croaking of a frog" and the "cooing of a dove or pigeon" and was described as a "rumbling, rustling noise," a "humming noise," a "whistling noise," a "buzzing in the chest," a "musical murmur or thrill," a "whining noise," and even a "rattle in the head."

Bellet and his associates have made a notable contribution in the problem of precordial noises in their articles on musical murmurs of aortic insufficiency. They emphasized the part played by eversion of an aortic cusp diseased by syphilis. In their first paper, only 1 of 11 patients had murmurs heard at a distance: "The patient's bedfellow was considerably annoyed by the unusual and constant noise." In this and three other instances the murmurs were audible to the patient, presumably in the same

distressing way as to Stokes' poor patient, who likened himself to a humming top. This distinction between murmurs heard by a patient but not by others suggests that vibrations may be transmitted directly to the cochlear apparatus through the bone, blood vessels, or other tissues of the body rather than by air transmission. In their second group of patients, 4 of 18 patients complained of hearing noises that interfered with sleep and made them nervous. One man produced such a noise that it disturbed his wife at a distance of 7 ft.

While this section was being written, I saw a patient with rupture of the aortic valve on the Medical Service of the University Hospitals at Iowa City. He was a 41-year-old cement worker. He and several members of his immediate family had dislocated lenses but no other stigma of arachnodactyly. Though he had had infrequent bouts of shortness of breath with exercise and other spells of palpitation with tachycardia, they had not interfered with work. He had no history of rheumatic fever. When he was examined for the Army in 1941 nothing was found wrong with the heart, but he was disqualified because of his eyes. On Sept. 19, eight weeks before hospitalization, he experienced the sudden start of dyspnea while he was laying a cement floor, but there was no direct connection with any act of lifting or straining, even though he joked about handling 100 lb. objects as trivial. Dyspnea even at rest has characterized his state ever since. Orthopnea and edema increased in severity until he was admitted to the hospital. Examination disclosed the usual features of congestive failure and the peripheral and cardiac signs of free aortic regurgitation. After a regimen of rest, digitalis, diuretics, and restriction of salt, he was much improved. The heart evidenced great overactivity, chiefly of the left ventricle. A diastolic thrill was intense in the second right interspace and the third and fourth left interspaces. Pulsation of the subclavian and carotid arteries gave evidence of the wide pulse pressure, which was measured as 150/0 mm. Hg. There were pistol shot sounds, Duroziez's murmurs, a Corrigan pulse, and capillary pulsations. At the base there was a loud diastolic murmur with a rough grating quality, not at all musical. This spread over the entire precordium, and over the mitral area I heard the presystolic rumble of a Flint murmur, which had been mistaken for that of mitral stenosis on admission. A loud systolic murmur occurred at the base. There was no aortic valve closure sound, but the pulmonary second sound was loud. The diastolic murmur was so loud that it was clearly heard by the unaided ear 1 in. from the chest on the ward and 6 in. away in a quiet room. It was not audible to the patient. Roentgenograms revealed 4+ left ventricular enlargement and no left auricular enlargement. Electrocardiograms showed the pattern of left ventricular hypertrophy. After further convalescence the patient was discharged, and although his exercise tolerance is poor, he is not in congestive heart failure.[1]

BIZARRE AND MISCELLANEOUS SOUNDS

Some records of sounds heard at a distance from the chest are so obscure as to defy precise classification. Perhaps the first example of such strange cases is the one in a footnote in Laennec's book on auscultation, a case recorded by Andral, as follows: "I lately saw a woman who complained of palpitations of the heart. Each stroke of this organ was accompanied by a peculiar gurgling sound, which evidently came from the precordial region, and was heard only when the heart struck the ribs; it was perceptible at a distance." Frost and Bing, whose admirable but brief review of the subject of loud precordial noises appeared in 1940, described a healthy 22-year-old woman who was seized suddenly by a "crick in the back," a sensation that something had come loose in her chest, and then pain in the chest and left shoulder. A blowing systolic murmur and some vague scratching sounds were heard along the left sternal border. During hospitalization, she had a sense of precordial fulness, "like a ball being squeezed out between two fingers," and sounds came from her precordium so loud that they were heard 3 m. away. The sounds were synchronous with the heart beat and were loudest when she was lying on her left side, disappearing when she turned to the right. Phonocardiograms showed the sounds to be systolic in time but spaced at variable intervals from beat to beat. Intensive roentgenographic and other studies failed to reveal any lesion of the lung, pleura, pericardium, or heart. The likeliest guess is that pulmonary interstitial emphysema was responsible, but the issue is in doubt.

Warburg, who scarcely mentioned such phenomena in his monograph on cardiac trauma, described elsewhere a man with mitral stenosis and auricular fibrillation observed many times in congestive heart failure. With an obscure infection he had fever of short duration, and "during the last 24 hours he had heard a sound from his chest which he described as though something were dripping; he said that he thought his heart had burst. His wife was able to hear the sound when she was lying in the bed beside him. I was able to verify his statements. At every heart beat a clicking or slightly sonorous sound was audible in the room. . . . A phonocardiogram showed that besides the sounds usually found in this patient there was a new murmur, partly during the systole, partly immediately after the systole. It was quite clear that the new sound included higher frequencies than the other sounds."

Levine and Harvey recorded the case of a 45-year-old woman with well-compensated mitral stenosis and auricular fibrillation. After exercise, a weird sounding, rough musical murmur "was actually heard with the naked ear a foot away from the chest . . . For several years she had been aware of a peculiar noise in her chest at times. We have heard it at irregular intervals, sometimes only for a few seconds, at other times constantly and then it might be absent for days. It is not related to position of the body or to breathing. . . . There is no x-ray evidence of diaphragmatic hernia or any other abnormality that might throw light on its causation."

Dr. Lewis January has called to my attention a rare instance of a healthy young man whose heart sounds were clearly audible several inches from his mouth when it was held open. He had no heart disease. X-ray study of the chest, esophagus, and upper gastrointestinal tract showed them to be normal. Perhaps some anatomic quirk permitted his esophagus to be patulous when his mouth was

1. Since submission of this paper for publication this man died suddenly at home. No autopsy was performed.

open and to act as a megaphone. Although I have looked for such a sign many times, I have not yet come across it.

In conclusion, I offer an autobiographical note: Occasionally, when my stomach contains just the proper quantity of fluid and air, a happy postprandial mixture, and when semirecumbent in an easy chair, a systolic tinkle or splash is clearly audible to me and very diverting. It has been heard by others a foot away. The cardiac impulse on the diaphragm and stomach obviously produces the sound. It generally vanishes after a few minutes or can be eliminated by belching; but swallowing air or air and water has not brought it back at will.

COMMENT

Beyond serving as a repository for esoterica, is there usefulness in collecting such diverse disorders with the common denominator of noise heard at a distance from the chest? Certain gleanings may reward closer study. While the figures defy statistical analysis, data in the table suggest that loud heart murmurs are the commonest cause of the phenomenon, followed by interstitial emphysema, pneumothorax, and pneumopericardium. Records of the other conditions are less numerous. From the topographical and mechanical view, air free in the chest from interstitial emphysema or pneumothorax, spontaneous or accidental, heads the list; cardiac murmurs come next and then pneumopericardium. Since the sources of this review have been casual and the survey sporadic, the data may not be representative. In some specialties, particular problems may be missing or too heavily represented. A surgeon's reading and experience would no doubt assemble a different array of noise producing conditions.

Conditions Causing Precordial Noises

Condition	No.	%	Total %
Heart murmurs	57	35	35
Spontaneous interstitial emphysema	28	17	21
Traumatic interstitial emphysema	6	4	
Spontaneous pneumothorax	15	9	16
Traumatic pneumothorax	12	7	
Pneumopericardium	25	15	15
Abnormalities of the alimentary canal	8	5	5
Miscellaneous	7	4	4
Air embolism	6	4	4
Location			
Lung and chest	61	..	37
Heart valve	57	..	35
Pericardium	25	..	15
Alimentary canal	8	..	5
Miscellaneous	7	..	4
Heart or pulmonary artery (air embolism)	6	..	4
Organ			
Heart: Valve	57	..	55
Heart: Pericardium	25		
Heart: Air embolism	6		
Chest and lung	61	..	36
Other	15	..	9
Mechanism			
Air	100	..	61
Heart valve	57	..	35
Other	7	..	4

The general problem of such noises may be considered by using interstitial emphysema of the lung as an example. In such a disturbance the noises heard at a distance are an exaggeration of a sign that much oftener is confined to the chest and can be heard only by the customary method with the stethoscope. Noises heard at a distance may be so loud as to command instant notice or may be heard by the unaided ear only after being heard with the stethoscope and then listened for attentively. Phonocardiographic records, of which several are reported, serve to demonstrate the sometimes irregular timing of such noises during systole and perhaps quiet the suspicion of skeptics that such noises are illusions. What constitutes the urge to publish case reports has never been known, but one has only to hear these eerie sounds to appreciate the high clinical drama. Published cases represent an unknown fraction of those met clinically. Certainly, illuminating papers, such as the late Louis Hamman produced, were followed by a wave of case reports, and a useful diagnostic sign caught popular fancy and became a medical fashion.

Clinical features of spontaneous interstitial emphysema of the lung may suggest acute myocardial infarction, but usually the complaint of pain in the chest is more insistent than the meager signs of difficulty. The patient is in pain but looks well, usually breathes easily, and is not in shock. Generally he is young, vigorous, and active, without signs or a history of hypertension, angina, or vascular disease. Later reactions, such as fever, leukocytosis, and rapid erythrocyte sedimentation, do not follow. Such a loud noise may be produced only in certain positions, so that change of position or movement will enhance or quiet the ticking chest. The noises have been reported as audible at a distance in about 10% of the recorded cases. The loudest noise, measured in distance heard, was perceived 20 ft. from the patient. Duration varied from two hours to two weeks. There was much variation in the intensity; sometimes everything would be quiet and then the sounds would return. As a general rule, they would come and go. In all except one case, the sounds were heard best with the patient lying on his or her left side, and many were able to demonstrate the sound at will by assuming the proper position. I saw one young man whose main distress was not the pain in the chest but the fact that the noise coming from his chest was so loud his wife made him sleep in the next room. He could not turn and eliminate it, but finally it went away, and he gained his reprieve. Several other reports suggest that such noises are a rare cause of temporary domestic infelicity, and they are alarming to patient and family. Indeed, fear and curiosity occasionally have brought the patient to the doctor, since there may be little associated pain.

Subcutaneous emphysema has been recorded in only a few cases, but since it may be confined to a small area and be ephemeral it is easily overlooked. In almost all cases of interstitial emphysema of the lung, if complicating pneumothorax occurred it occurred on the left side. Often it has been so small that only careful search with proper alignment has produced diagnostic roentgenographic shadows. Right-sided pneumothorax does not appear to be rarer than the left-sided kind, but only rarely has it been found in association with the crunching, bubbling, paper-rustling sound (Hamman's sign) so characteristic of mediastinal emphysema. I found no record of right pneumothorax associated with the distantly heard noise. The most comprehensive discussion

of such sounds in interstitial emphysema was given by Greene, who differentiated between two classes of sounds. "The bubbling, crunching, clicking and some of the tapping sounds are due to the heart rubbing against emphysematous blebs in interstitial emphysema of the lung and mediastinum. The knocking and tapping metallic sounds, on the other hand, are due to the heart striking an emphysematous bleb on the median aspect of a partly collapsed left lung or the diaphragm immediately over a gas bubble in the splenic flexure of the colon in the presence of pneumothorax of the left side." The evidence on which these conclusions are based is the fruit of careful study, and, short of detailed human experiments, is the best we are likely to get from observing the effects of accidents and disease.

While the absence of distantly heard noises can only be inferred, the consistency of the record suggests that there is clinical significance in its omission from certain reported cases; for example, in the extensive literature on pneumoperitoneum, such noises are not listed. I have not encountered the phenomenon in reading about or seeing the abdominal catastrophes in which air leaks from the ruptured gut. It is not recorded in reports of interstitial emphysema and left-sided pneumothorax in infants and young children, although Hamman's sign occurs. The assumption is that the noises require the larger heart and fuller sounding board of the adult thorax for their distant propagation. Likewise, the left ventricle and aortic valve rather than the less muscular right ventricle have been associated with heart murmurs heard at a distance.

Diagnosis of such rare conditions is important, because the cause may be a mechanical crisis that can be corrected or eased. Delay or confusion may be fatal. On the other hand, if the causal condition is innocuous, it is well to avoid mistaking it for conditions of ominous import. In order of urgency, the *Mühlengeraüsch* or mill wheel sound of air embolism stands first. Its clinical debut, always unexpected, is associated with an opening by wound, scalpel, or needle by which air gets into veins. Immediate rotation to the left lateral position or the Trendelenburg position, trapping air bubbles above the blood in the right ventricle where they may be aspirated with a needle and syringe, may be lifesaving. Inhalation of 100% oxygen may help.

Rupture of the esophagus, which I have seen produce Hamman's sign, probably can cause loud noises, even without pneumopericardium. Since surgical cure in such a calamity may now be anticipated, the diagnosis of a ruptured gullet should be considered, especially in cases in which a history of extreme vomiting or instrumentation makes the condition probable.

Traumatic pneumothorax, pneumopericardium, and pneumomediastinum with the connotation of crushed ribs or penetration by a missile or foreign body, obviously urgently require treatment. The attending noise may indicate the extent of damage, which otherwise is not apparent. Treatment is that of the underlying condition.

Spontaneous interstitial emphysema of the lung implies pneumothorax and, at times, the hazard of tuberculosis. The noise heard at a distance has not been nearly so ominous as it has seemed to the victim, always amazed and often terrified by such uncanny behavior. Thus, diagnosis usually permits reassurance, since in all recorded cases the patients have survived. It should be kept in mind that tension pneumothorax may lurk under this clinical camouflage. Also, "air lock," the dissection of air through the lung or hilum under enough pressure to impede blood flow, may require more heroic measures, i. e., administration of 100% oxygen or, perhaps, surgical intervention to stop the leak if it can be found. In general, the major role of the physician in these cases is to calm terror by bringing assurance.

Noise from the alimentary canal may rarely lead to the discovery of hiatus hernia with an errant stomach or colon. Loud murmurs, when they have arisen out of the innocuous quiet of the past, especially under some stress or accident, may call to mind the likelihood of ruptured aortic valve or the turning inside out of a syphilitic valve cusp. Giving a better view of prognosis, such diagnostic tours de force escape the odium of academic banality, and who would say that the surgeons will not soon be able to repair or reline stenotic or ruptured valves? Pneumopericardium, apparently of great rarity now, calls for a review of the eroding and destroying processes that permit air to escape into the pericardium from adjoining air-containing structures. Therapeutic pneumopericardium has its own obvious cause, and its insubstantial vogue is past.

SUMMARY

A variety of clinical conditions that may be associated with precordial sounds heard by the unaided ear at a distance from the chest is assembled, compared, and assessed. The commonest causes of such sounds are cardiac murmurs produced by valve rupture or other lesion, often abrupt in onset and a consequence of stress or strain. Next in order of frequency come interstitial mediastinal and pulmonary emphysema, both spontaneous and traumatic. These are followed by spontaneous and traumatic pneumothorax, pneumopericardium, noises the heart produces by striking air-containing gut, air embolus, and a small mysterious miscellany of unexplained sounds. Since the noises considered have diverse sources there is no pathophysiological common denominator to compare with the clinical fact of abnormally great volume of sound. With such differences in cause and, hence, in necessary treatment and prognosis, attention should be directed to the cause, which usually comes to light on careful clinical scrutiny.

If the spirit of Robert Hooke were with us on this occasion, I am sure his interest in natural phenomena would have had some stimulus, and perhaps he would be amused at my answers to his query, "Who knows but that one may discover the works performed in the several offices and shops of a man's body by the sounds they make, and thereby discover what instrument or engine is out of order!" This commemorative tribute I trust Roger Morris would have enjoyed and given his approval in principle, if not in detail of execution. Finally, lest so much aseptic levity make you think the subject is not important, I conclude, in all humility, with a verse of scripture (Jeremiah 17:9): "The heart is deceitful above all things. . . . Who can know it?"

COMBINED ANTIBIOTIC THERAPY IN REFRACTORY URINARY TRACT INFECTIONS

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Comprehensive in vitro studies by one of us (G. M. E.)[1] on the inhibition of various bacteria by antibiotic combinations indicated that a combination of aureomycin, oxytetracycline (Terramycin), and chloramphenicol possessed antibacterial properties that were not evident when these antibiotics were tested singly in equal concentrations against the same organisms. The present study, part of a more extensive project to be reported later, was undertaken to test this combination clinically. In this report, major emphasis will be placed on our experiences in the treatment of selected patients with refractory urinary tract infections. In addition, attention will be directed to the significance of certain factors, which became manifest only after the study had progressed for a time and which we now believe are fundamental to proper clinical evaluation of any antibacterial agent intended for use in this type of infection.

MATERIALS AND METHODS

The antibiotic combination, hereafter referred to as AOC, consisted of pure crystalline aureomycin hydrochloride, oxytetracycline hydrochloride, and chloramphenicol combined in equal proportions on a weight basis. It was dispensed in 0.5 gm. amounts in gelatin capsules. Administration was by the oral route, 2 to 3 gm. daily in divided doses, the larger dose being employed where in vitro tests suggested moderate resistance of organisms. While most of the patients were treated for only 5 days, a few of those with severer cases received courses of from 7 to 10 days.

The series comprised 36 patients divided into three groups as follows: 1. Group A comprised seven patients studied and treated with AOC by the ward staff on the medical service. Specimens for urine culture were obtained by nursing personnel and examined by procedure 1 (described below). 2. Group B was composed of 15 patients on the urologic service, studied by us solely to evaluate the reproducibility of urinary flora in specimens collected by nursing personnel. Specimens from this group were examined by procedure 2. 3. Group C was made up of 14 patients initially studied and treated by the ward staff of the medical service but subsequently studied bacteriologically and treated with AOC by us. Specimens for culture were collected by us. In the case of men, the glans penis was first cleansed with sterile cotton moistened with sterile green soap and the patient instructed to void. The urine initially voided was discarded. The latter portion was collected with care being taken to avoid contact between the glans and the specimen bottle. Female patients were draped in bed, or, whenever possible, on an examining table by a nurse. A catheterization tray, containing sterile towels, metal catheter, specimen bottles, and solution cups, was placed conveniently at hand. After the patient was draped with the sterile towels and the vulva cleansed with sterile cotton moistened with green soap, the metal catheter was inserted and the urine collected by an assisting nurse as it issued from the catheter. A similar technique was employed in catheterizing men. The specimens were examined by procedure 2. All materials used in collecting specimens from patients in this group were prepared and sterilized by personnel of the bacteriology department.

Procedure 1.—One-half milliliter of specimen was transferred aseptically to a tube of blood culture medium and incubated overnight at 37 C. Smears were prepared and stained by Gram's method. Appropriate plating and determinative procedures were applied to the isolated organisms. Antibiotic susceptibility tests were made by the modification of the filter paper disk procedure.[2] Susceptibility to AOC was determined by use of disks saturated with a solution of antibiotic combination so as to contain 1.25, 2.0, and 5.0 mcg. of aureomycin, oxytetracycline, and chloramphenicol, respectively.

Procedure 2.—Fifteen milliliters of specimen was placed in a sterile centrifuge tube and sedimented for 15 minutes at 3,000 rpm. Following decantation of the supernate, one portion of the sediment was serially streaked on blood, bromothymol blue lactose, and SS agar plates. A second portion was distributed with a sterile swab on the surface of a blood agar plate to be used for susceptibility tests. Finally, a third portion was used to prepare smears for microscopic examination. Thus, it was possible to determine the morphology of the bacterial flora in the specimen in a minimal interval of time after collection, correlate the morphological types found on culture with those seen on smear, and ascertain the antibiotic susceptibility of the flora, all within a period of 18 to 24 hours. Thus, if it was desired to check on the constancy of the bacterial flora, it could be done on duplicate specimens within a 36 to 48 hour period.

RESULTS AND COMMENT

Initial Clinical Trial of AOC.—For this purpose, the seven patients in group A were utilized. Tables 1 and 2 present the data pertinent to diagnosis, renal function,

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Because of lack of space, the tables have been omitted from THE JOURNAL and will appear in the authors' reprints.

J. M. O'Loughlin assisted in the bacteriological studies, and the chiefs of the Medical and Urologic Services granted permission to study their patients.

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The oxytetracycline (Terramycin) used in this study was supplied by Chas. Pfizer & Co., Inc., Brooklyn; the chloramphenicol by Parke, Davis & Company, Detroit; and the aureomycin by Lederle Laboratories Division, American Cyanamid Company, New York.

1. Eisenberg, G. M., and O'Loughlin, J. M.: Bacterial Susceptibility to Antibiotics: III. In Vitro Studies of Antibiotic Combinations; IV. Comparative Activity of a Selected Combination Versus the Individual Components, to be published.

2. Eisenberg, G. M., and Wagner, B. M.: Bacterial Susceptibility to Antibiotics: II. Determination by Means of a Standardized Routine Procedure Having Clinical Significance, Am. J. M. Sc. **223**: 600-606, 1952.

therapy, bacteriology, and results in each of the cases. When an attempt is made to evaluate this data, it is immediately apparent that unequivocal conclusions regarding the effectiveness of the AOC combination cannot be drawn in each of these cases. The reason for this becomes obvious when consideration is given to the bacteria present before and after treatment in relation to the time of institution of the therapy. For example, in case 3 the urine culture before treatment with sulfisoxazole (Gantrisin) showed Pseudomonas aeruginosa and enterococcus. During sulfisoxazole therapy coliform and Proteus organisms were found, while on conclusion of this therapy, coliform, Proteus, and enterococcus organisms were found. On bacterial grounds, it might be concluded that sulfisoxazole treatment had successfully eradicated the Pseudomonas organisms, temporarily eliminated the enterococcus, and induced the appearance of the coliforms. Excluding, at present, the possibility of contamination, such variation in flora might be explicable on the basis of observation by others,[3] that after antibiotic therapy variations in flora are to be expected. A period of four days intervened between the post-sulfisoxazole culture and the start of treatment with AOC, during which time no specimens were collected. The post-AOC culture showed "no growth." There is, thus, a great temptation to claim that the AOC therapy had successfully eradicated the organisms surviving the sulfisoxazole therapy. This conclusion might be justified, provided that the possibilities of contamination were eliminated beyond reasonable doubt. That such an assumption can be frequently unjustified is apparent from consideration of table 3. This shows the variation in flora found in consecutive urine specimens collected at 24 hour intervals from 18 patients (group B) on the urologic service who were not receiving treatment. In 11 of the 15 cases (74%) it was not possible to demonstrate the same urinary bacteriology in two consecutive specimens taken within a 24 hour period. (These patients did not have urethral manipulation or antibiotic therapy.) While the remaining four patients yielded a reproducible flora under the same conditions, one of these (case 21) showed a variation in the third and fourth specimens taken five days later. It seems very unlikely that such an intrinsic urinary flora variation would exist in patients with a stable homeostasis unmodified by internal drug therapy or external urethral manipulation, and, while this possibility has not been entirely eliminated, it seems probable that Barnard and his associates [4] are correct in their view that under these conditions the urinary flora would be expected to remain constant. Any variation observed would most likely be attributable to contamination at the time of obtaining the specimen. It would then seem reasonable to question the significance of the findings on a single urine specimen. If there is doubt in this connection, it is only logical that there should be difficulty in evaluating the effect of a therapeutic agent prescribed in such a case. As an illustration, attention is directed to case 5 (table 1). A single culture taken two days prior to AOC therapy revealed Escherichia coli and enterococcus. A culture taken one day after therapy showed "no growth." Again, there is the temptation to ascribe what appears to be successful eradication of the organisms to the AOC therapy, but this is not completely justified in view of the experiences with variations in the 24 hour flora seen in the cases in table 2. We are forced to conclude that a reliable, unprejudiced evaluation of antibiotic therapy of urinary tract infections depends on unequivocal establishment of the identity of the infecting flora. In our experience, this can be accomplished only through the adoption of the best available techniques, both in the collection and examination of the specimens and by the taking and examining of multiple pretherapy specimens.

Second Clinical Trial of AOC.—With this basic principle in mind, AOC was used to treat the 14 patients in group C. Table 4 shows the data pertinent to diagnosis and renal function in these cases. Table 5 shows that the first five cases, each showing a single organism susceptible in vitro to AOC, cleared of bacilluria, pyuria, and fever. This was accomplished in four cases, with a total of 10 gm. of the combination over a five day period; one patient received 14 gm. in a seven day course. In two of the cases, no antibacterial therapy preceded the AOC; the other three patients had received penicillin (crystalline and/or procaine), streptomycin, sulfisoxazole, or sulfadiazine, at one time or another during the period preceding AOC therapy.

In the second group of four cases (table 6), each showing a single organism susceptible in vitro to AOC, the bacteria found before AOC were eliminated only to be replaced, after cessation of this therapy, by generically dissimilar organisms; however, pyuria and fever where present were also eliminated. The nature and distribution of this post-AOC flora was as follows: 1. Micrococcus species only, two cases each treated with 2 gm. of AOC daily for five days. 2. Proteus species only, one case of Salmonella choleraesuis bacilluria treated with 20 gm. of AOC in a 10 day period. There was evidence in this case that the finding of Proteus micro-organisms was associated with traumatic cystitis, probably resulting from excessive urethral manipulation. 3. Micrococcus and Proteus species, one case treated with 3 gm. of AOC daily for five days.

In all of these cases, no antibacterial therapy preceded the AOC combination. Cases 32 and 33, shown in table 7, are characterized by the fact that in both the infecting organism isolated prior to AOC therapy was temporarily eliminated by it but recurred shortly after its cessation. Both patients had received penicillin prior to AOC, the patient in case 32 receiving almost 29 million units in an 11 day period, while the one in case 33 was given almost 10 million units in 12 days, for 10 of which 33 gm. of sulfisoxazole was given additionally. The failure of 15 gm. of AOC to permanently clear the Pseudomonas from the urine in case 32 may have been due to the fact that this organism was found to be moderately resistant to an AOC concentration equivalent to that which might have been expected on a 3 gm. per day, five day dosage schedule. It would have been interesting to determine whether a second, more prolonged course of AOC would

3. Rhoads, P. S.; Billings, C. E., and O'Conor, V. J.: Antibacterial Management of Urinary Tract Infections, J. A. M. A. **148**: 165-170 (Jan. 19) 1952. Yow, E. M.: Development of Proteus and Pseudomonas Infections During Antibiotic Therapy, ibid. **149**: 1184-1188 (July 26) 1952

4. Barnard, D. M.; Story, R. D., and Root, H. F.: Urinary Tract Infections in Diabetic Women, New England J. Med. **248**: 136-141, 1953.

have produced a more permanent bacteriological remission. This could not be attempted because of the patient's desire to return home. The bacteriological relapse seen in case 32, despite susceptibility of the organism, is explicable on the basis of anatomic obstruction (stricture) and the short therapeutic course, 8 gm. in four days.

The final group of three patients (cases 34, 35, and 36) are characterized by urinary tract infections caused by multiple, mixed bacteria, of which at least one member was found to be resistant to AOC in vitro. In spite of this, these patients were treated with AOC for two reasons: 1. All other therapies employed had failed to produce the desired response. 2. There was a possibility that through the elimination of the AOC-susceptible members the remaining flora might likewise disappear as a result of distortion in the microbiological balance. That neither of these ends was accomplished is evident from the results. In case 34 the susceptible Klebsiella micro-organisms were eliminated, only to be replaced by micrococci; resistant Proteus persisted. In case 35 AOC therapy eliminated the susceptible Pseudomonas and had no effect on the insensitive Proteus and paracolon microorganisms. In passing, it is well to point out that these same organisms were not eliminated by a three day subsequent course of streptomycin. In both of these cases the organisms eliminated by the AOC therapy had failed to be removed by 9 million units of penicillin (case 34) and 26 gm. of aureomycin (case 35). Far advanced renal functional impairment may have been a contributory factor in this case. The therapeutic failure of AOC in case 36 can be ascribed to the age, general debilitation, and diminished renal blood flow, secondary to congestive failure. Similar therapeutic failure was experienced following courses of combinations of procaine penicillin sulfisoxazole and sulfadiazine-streptomycin.

CONCLUSIONS

In summarizing our impression of the merit of the AOC combination, we acknowledge that follow-up examinations are essential for the determination of permanency of cure in these cases. In this respect, serious limitations are imposed when dealing with patients usually seen in a large municipal hospital for the indigent. In spite of the comparative brevity of the follow-up interval in our cases, we nonetheless feel that certain conclusions can be justifiably made.

In five patients there was complete disappearance of all bacteriological and clinical evidence of the urinary tract infection, which had been refractory to previous medication. In four patients there was complete disappearance of all clinical evidence of urinary tract infection. In these cases the responsible pathogen was eliminated only to be replaced by other organisms, the pathogenicity of which is doubtful in view of the improvement in clinical status and in collateral urinary studies. In two patients there was complete disappearance of clinical evidence of disease but only temporary removal of the offending pathogen. In three patients it was not possible to gage clinical effectiveness because of the lack of characteristic signs and symptoms before therapy. In two of these, with mixed pathogens, the susceptible organisms were eliminated. The third was a therapeutic failure, age and general debilitation contributing to the result. Toxic manifestations, such as nausea, vomiting, and diarrhea were not apparent in the doses used.

AOC combination was effective against such organisms as Klebsiella pneumonia type A, other Klebsiella species, coli-aerogenes, Salmonella choleraesuis, enterococcus, Pseudomonas aeruginosa, and Micrococcus pyogenes var. aureus. The appearance of bacterial opportunists, Micrococcus species in our cases, is not peculiar to AOC therapy. This phenomenon, involving other organisms, has been observed frequently following use of other antibiotics.[5]

SUMMARY

The results of treatment of refractory urinary tract infections with a combination of aureomycin, oxytetracycline (Terramycin), and chloramphenicol (AOC) are presented. While the number of cases treated under controlled conditions that permit unequivocal evaluation of the therapy was small and the follow-up period of short duration, results suggest that this combination has merit and is worthy of additional clinical study. Evidence is presented to demonstrate the desirability of multiple pretherapy cultures in order to permit objective evaluation of antimicrobic therapy.

255 S. 17th St. (Dr. Flippin).

5. Christie, R. V., and Garrod, L. P.: A Review of the Work of a Penicillin Therapeutic Research Unit, Brit. M. J. **1**: 513-514, 1944. Bacterial Versatility, editorial, Ann. Int. Med. **36**: 196-202, 1952. Finland, M.: The Present Status of Antibiotics in Bacterial Infections, Bull. New York Acad. Med. **27**: 199-220, 1951. Miller, C. P.: New Problems in the Treatment of Infectious Diseases, Ann. Int. Med. **35**: 763-770, 1951.

Subphrenic Infections.—In subphrenic infections the safety and recovery of the patient depends to a great extent on the correct diagnosis being made. It can usually be diagnosed if the possibility of its existence is kept in mind. In any patient with an unexplained fever, and especially following abdominal suppuration, the likelihood of subphrenic infection should be considered. . . . Subphrenic infection results in a fever of the swinging type and general toxic signs and symptoms which may result in rapid deterioration in the patient's general condition. The patient may complain of pain or discomfort in the upper abdomen or over the lower ribs posteriorly. Tenderness on pressure may be present but its absence by no means excludes the infection. As a rule the tenderness is in relation to the 12th rib posteriorly, or below the costal margins in anterior space infections. The most useful and constant physical sign is some limitation of movement, on respiration, of the lower part of the chest on the affected side. This is usually most easily detected from behind and is due to limitation of diaphragmatic movement on the affected side. Apparent increase in the liver dullness may be noticed. There may be signs of a basal pleural effusion, usually of a sympathetic nature, on the affected side or of basal lobular pulmonary atelectasis. The white blood count, not unnaturally, shows a polymorpho-nuclear leucocytosis. The most useful aid to diagnosis is the use of x-rays, and examination under the fluorescent screen is usually more valuable than by means of films. The most constant x-ray finding is that the diaphragm is raised on the affected side and that the range of movement on respiration is diminished compared with the normal side. It may be possible to see an accumulation of gas in the upper part of the subphrenic abscess with a horizontal fluid level below it, but this is not nearly so common as writers in the past have tended to suggest. The gas is usually due to the fact that the subphrenic abscess has communicated with a hollow viscus, such as in the case of perforated peptic ulceration, rather than to the presence of gas-forming organisms within the abscess.—A. B. Birt, M.D., Subphrenic Infection, *Postgraduate Medical Journal*, May, 1953.

FLUID AND ELECTROLYTE DISTURBANCES IN PROSTATISM

Jack Lapides, M.D., Ann Arbor, Mich.

During the past decade or two great strides have been taken in reducing the morbidity and mortality associated with the treatment of prostatism. This progress has been attributed to earlier diagnosis, improved surgical techniques, introduction of modern antibiotic and chemotherapeutic agents, liberal use of whole blood, and, more recently, employment of fluid and electrolyte repair solutions. Since metabolic disorders are relatively frequent in the patient with urinary retention, it is apparent that fluid and electrolyte imbalances are common and important problems. In order to treat these disturbances rationally, one must have a knowledge of the role played by the kidney in the pathogenesis of the electrolyte disorders, as well as a comprehension of its clinical and laboratory manifestations. In this discussion an attempt will be made to indicate the causes of the electrolyte disorders, the types of imbalances most frequently encountered, and the rationale for the use of particular repair solutions.

EFFECT OF BACK PRESSURE ON RENAL FUNCTION AND STRUCTURE

Complete or partial obstruction of the lower urinary tract by an enlarged prostate results in urinary retention. The accumulation of urine in the bladder raises the intravesical pressure, which in turn leads to an increase in intraureteral and intrapelvic pressures. The increased pressure is reflected up the infundibula, calices, and tubules of the nephrons. Since effective glomerular filtration pressure is the difference between the intravascular hydrostatic pressure on the one hand and the sum of the osmotic pressure of the plasma proteins and the intrarenal tissue pressure on the other,[1] it will be observed that the increase in intrarenal tissue pressure produced by the urinary retention will result in decreased glomerular filtration (fig. 1). Glomerular filtration will be impaired further because of decreased blood flow due to compression of the blood vessels by the increased intrarenal tissue pressure.[2] Tubular function will be disturbed also [3] because of a decrease in the peritubular capillary blood flow, which is due to compression of the vessels by increased intrarenal pressure.

If the urinary retention is of short duration, it is probable that no structural changes will occur; however, prolonged lower urinary tract obstruction will result initially in anemic and pressure atrophy of the tubules. Later, the glomeruli will be destroyed so that the kidneys in the end stage become connective tissue shells.[4] It has been demonstrated experimentally in animals [4] that removal of the back pressure will result in structural repair and restoration of function, the degree being dependent on the period of obstruction. In man, following drainage of the bladder, improvement has been observed to take place in both glomerular and tubular function [5]; the function of the tubules, however, appears to recover to a greater extent. The period of time necessary for maximal improvement may be one to two months in some instances.

ELECTROLYTE DISORDERS

Mechanism.—In the healthy person normal renal function serves to maintain a relatively constant environment for the cells of the body so that they can carry out their appropriate activities in a normal manner. Impaired kidney function will lead to aberrations in the chemical structure of the plasma, the interstitial fluid and the intracellular fluids, with resultant serious disturbances in cellular functions. These cellular dysfunctions then manifest themselves by such clinical signs and symptoms as nausea, vomiting, anorexia, ease of fatigue, and anemia.[6]

Normally the kidneys help to maintain homeostasis by "screening the blood plasma" continuously, i.e., the renal nephron deletes the blood plasma of substances that are in too great a concentration and attempts to retain most of any material that is approaching subnormal levels. For example, the kidneys tend to retain most of the glucose, sodium, chloride, bicarbonate, and water that is filtered but seek to excrete the larger portion of sulfates, phosphates, urea, creatinine, and uric acid. It is apparent that the waste products of protein catabolism (sulfates, phosphates, and nonprotein nitrogen) are excreted while the substances necessary for cellular building and activity are retained. Other considerations that govern the kidneys' activities are the necessity for maintaining a blood pH of 7.4 and a plasma volume of approximately 3,000 cc. Before discussion of the types of electrolyte disturbances encountered in urinary retention, it would be well to emphasize that more than 60% of the patients seen with prostatism do not have fluid and electrolyte abnormalities.[7]

Group 1.—The first group to be considered includes patients who have had urinary retention for a relatively short period of time and in whom little or no renal structural damage has occurred. In accordance with the mechanism described previously, these patients will have diminished glomerular filtration because of back pressure due to urinary retention. Impairment of glomerular filtration will lead to retention of all substances in the body; however, only those materials that are not needed by the body and are destined for excretion, namely, sulfates,

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From the Department of Surgery, University of Michigan Medical School.

Read at the Sixth Clinical Session of the American Medical Association, Denver, Dec. 4, 1952.

1. Smith, H. W.; Chasis, H.; Goldring, W., and Ranges, H. A.: Glomerular Dynamics in Normal Human Kidney, J. Clin. Investigation **19**: 751-764, 1940.

2. Levy, S. E.; Mason, M. F.; Harrison, T. R., and Blalock, A.: Effects of Ureteral Occlusion on Blood Flow and Oxygen Consumption of Kidneys of Unanesthetized Dogs, Surgery **1**: 238-242, 1937.

3. Pilcher, F., Jr.; Bollman, J. L., and Mann, F. C.: Effect of Increased Intra-Ureteral Pressure on Renal Function, J. Urol. **38**: 202-211, 1937.

4. Hinman, F.: Pathogenesis of Hydronephrosis, Surg., Gynec. & Obst. **58**: 356-376, 1934.

5. Lich, R., Jr.: Renal Dysfunction in Prostatism, Surg., Gynec. & Obst. **74**: 475-478, 1942.

6. Bradley, S. E.: Medical Progress: Biochemical Abnormalities During Renal Insufficiency, New England J. Med. **235**: 755-791, 1946.

7. Kahle, P. J., and Getzoff, P. L.: Evaluation of Preoperative Factors in Prostatic Surgery: A Review of 404 Consecutive Cases, J. Urol. **61**: 775-780, 1949.

phosphates, and nonprotein nitrogen, accumulate rapidly in the body; the nonprotein nitrogen level is the first to become elevated. Thus in the severest case in this group there might be a blood nonprotein nitrogen level of 70 to 80 mg. per 100 cc., a normal plasma protein level, normal values for sodium, potassium, and calcium, slightly elevated phosphorus, sulfate, and organic acid levels, and a slightly decreased plasma bicarbonate level (fig. 2).

The patients placed in group 1 usually do not have such symptoms and signs as nausea, vomiting, and anemia. They are dehydrated occasionally, because many persons believe that bladder distension and frequency of urination will be decreased if fluid intake is decreased.

Group 2.—The second group to be discussed includes patients who have had prolonged urinary retention and whose kidneys have been damaged structurally as well as functionally. Many of these patients have symptoms of nausea, vomiting, anorexia, and ease of fatigue. Some will be agitated and disoriented while others may be stuporous. Hyperpnea and dyspnea may be present. They will often have signs of dehydration or extracellular fluid volume deficiency.

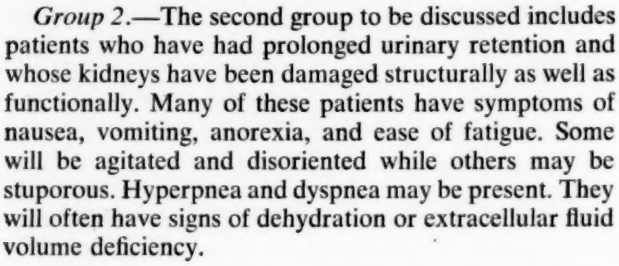

Fig. 1.—Comparison of normal kidney and kidney in urinary retention, showing how the increase in intrarenal tissue pressure in urinary retention results in decreased glomerular filtration.

Unfortunately, there is no one electrolyte profile that is typical of this group. This is in accordance with the findings of Peters and associates,[8] who found no constant ionic plasma pattern in diseased kidneys of various types. One can state, however, that in this second group the plasma bicarbonate level is always below normal; phosphate, sulfate, and frequently organic acid levels are elevated to above normal; and the nonprotein nitrogen value is always increased. The plasma protein sodium, total base, and calcium levels may be normal or decreased. Potassium and chloride values may be elevated, normal, or decreased. It will be observed readily, therefore, that correction of fluid and electrolyte imbalances in this group of patients must be individualized.

It has been assumed arbitrarily that after appropriate treatment the two groups that have just been discussed will have normal electrolyte patterns and will be able to undergo definitive treatment, namely, prostatectomy. There are some patients who do not fall into the previous two categories, since they will never come to operation because of far-advanced renal insufficiency. These patients will demonstrate electrolyte and fluid disturbances similar to those of the second group but, unlike the second group, will show little improvement with therapy.

8. Peters, J. P.; Wakeman, A. M.; Eisenman, A. J., and Lee, C.: Total Acid-Base Equilibrium of Plasma in Health and Disease: X. The Acidosis of Nephritis, J. Clin. Investigation **6**: 517-549, 1929.

9. Hinman.[4] Lich.[5]

10. Moyer, C. A.: Fluid Balance: A Clinical Manual, Chicago, The Year Book Publisher, Inc., 1952, p. 68.

THERAPY

Drainage.—Since back pressure due to urinary retention is the chief cause of renal impairment in prostatism, it is obvious that prompt relief of the urinary retention must be obtained. Bladder drainage will not only halt further renal deterioration but will result in considerable improvement in kidney function and structure.[9] Urethral catheter drainage is quite adequate for all of the patients in group 1 and for the mild cases in group 2. Suprapubic cystostomy, however, is the appropriate type of urinary drainage for the severe cases in group 2 and for all of the patients in group 3, since prolonged catheter drainage will be necessary for these patients before definitive surgery can be contemplated. The incidence of urethritis, epididymitis, and acute pyelonephritis is much less with

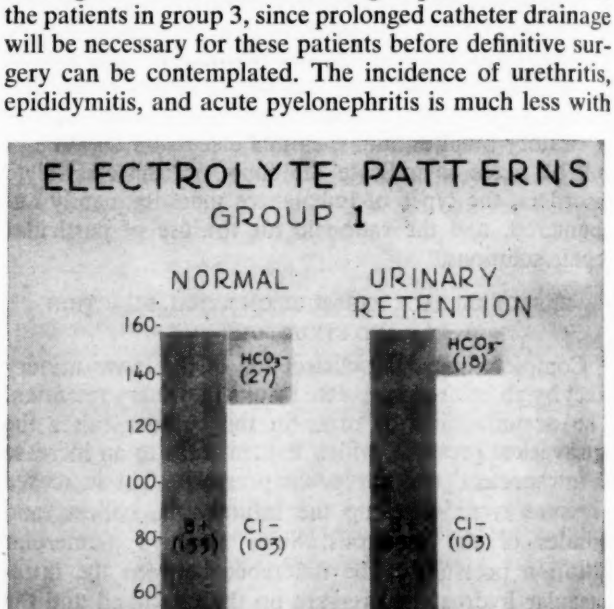

Fig. 2.—Electrolyte patterns in normal persons and in patients who have had urinary retention for a relatively short period of time, with little or no renal structural damage (group 1).

suprapubic drainage than with urethral catheter drainage. Acute pyelonephritis superimposed on an already impaired kidney is often enough insult to cause death.

Restoration of Chemical Balance.—In addition to urinary drainage, adjustment of the ionic pattern and fluid volumes of the vascular, interstitial, and intracellular compartments to a normal state is necessary. This requirement is apparent when it is realized that the patient's symptoms are due to abnormal cellular function, which in turn is caused by aberrations in electrolytes and fluids.

In estimating the type and quantity of solution to be used, one must be guided by both laboratory and clinical data. Since most hospitals have limited laboratory facilities, determination of the plasma bicarbonate, chloride, calcium, phosphorus, and nonprotein nitrogen levels will usually suffice as the basic laboratory data. Evaluation of the state of the extracellular fluid volume is based to

a great extent on clinical signs.[10] A marked deficit in extracellular fluid volume is characterized by (1) apathy, (2) anorexia, (3) illeus, (4) orthostatic hypotension, (5) tachycardia, (6) softening, shrinking, and longitudinal wrinkling of the tongue, (7) enophthalmos, (8) softness of muscles, and (9) below normal temperature.

A patient may be markedly dehydrated by loss of fluid without necessarily losing electrolytes. In this instance the patient will show thirst, dry mucous membranes, red swollen tongue, flushed skin, fever, tachycardia, and hypotension in addition to softening of the muscles, enophthalmos, and sticky skin. Dehydration of the types just described are the ones most commonly present in the patient with prostatic disease when he first presents himself to the physician.

Treatment of the patient who has had urinary retention for a short period of time (group 1) is a rather simple matter. His blood chemistry studies will indicate elevated nonprotein nitrogen, slightly decreased plasma bicarbonate, elevated plasma chloride, and slightly increased phosphorus levels. Clinical examination will demonstrate dehydration, with an increase in osmolar concentration of electrolytes or, more simply, loss of extracellular fluid without loss of electrolytes, thus resulting in an increased concentration of the electrolytes in the blood plasma and interstitial fluid. This type of dehydration takes place when the patient in urinary retention does not drink or eat. He may have dry sticky mucous membranes, a swollen tongue, flushed skin, fever, and tachycardia. Therapy consists of urethral catheter drainage and forcing fluids if the patient is not nauseated. If the patient is nauseated, approximately 3,000 cc. of 5% glucose in water given intravenously over a period of four to five hours will satisfy the initial 24 hour requirement for fluids. Solutions containing electrolytes are not indicated, since an increased osmolar concentration of electrolytes is already present; in addition, the metabolic acidosis is mild and will be corrected as soon as glomerular filtration is increased. The therapy advocated is aimed specifically at increasing glomerular filtration, in that the back pressure is removed by bladder drainage and the plasma volume is increased by the glucose solution. In addition, the glucose itself is of value, since it promotes diuresis as well as spares the further breakdown of body protein, the end products of which have been partial contributors to the azotemia and acidosis. Most of the patients will be taking fluids and food orally by the second day so that further parenteral therapy may not be necessary. The 24 hour urinary output should be maintained at a minimum of 2,000 cc. If it falls below the minimum, oral fluid intake should be supplemented with 1 to 2 liters of 5% glucose in water parenterally. With this therapy the patient should be ready for operation within three days.

The patients who have been in partial or complete urinary retention for a prolonged period of time present a more difficult problem in treatment. Because of long-standing azotemia and acidosis, they are usually malnourished, dehydrated, anemic, and in poor general physical condition. Blood chemistry studies in a typical case may reveal a nonprotein nitrogen level of 200 mg. per 100 cc., plasma bicarbonate level of 15 mEq. per liter, plasma chloride level of 95 mEq. per liter, and serum calcium level of 4 mEq. per liter. The serum potassium levels in these patients are frequently above normal before urinary drainage and fluid therapy, although there may actually be a decreased concentration of potassium intracellularly. Physical examination of the patient may disclose evidences of dehydration and uncompensated metabolic acidosis, namely, hyperpnea and dyspnea.

After the history has been taken, the patient examined, and emergency blood chemistry studies accomplished, therapy is indicated. If the patient has an inlying urethral catheter when first seen, suprapubic cystostomy is postponed for several days. If the patient has not been catheterized previously, then he is subjected immediately to a suprapubic cystostomy under local anesthesia. Fluid and electrolyte therapy is started as soon as possible.

Analysis of the hypothetical case described reveals that the patient has (1) uncompensated metabolic acidosis, (2) extracellular fluid deficit or dehydration,

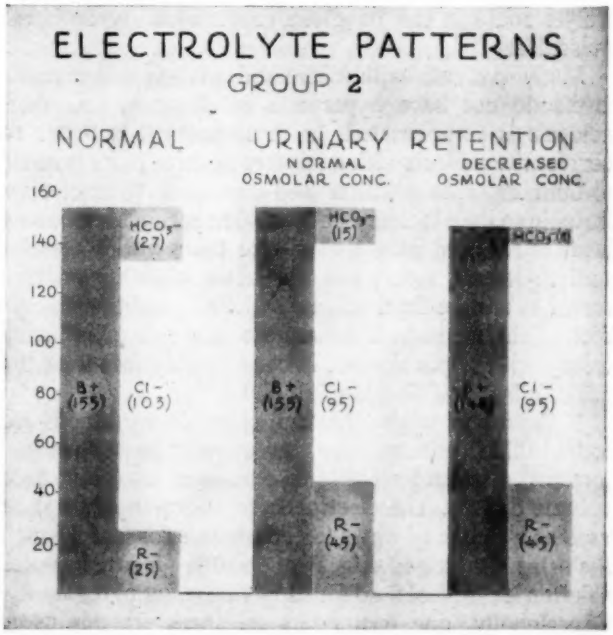

Fig. 3.—Electrolyte patterns in normal persons and in persons who have had prolonged urinary retention, with resultant structural as well as functional damage (group 2).

and (3) probable normal osmolar concentration of electrolytes. Normally the sum of plasma chlorides (103 mEq.) and plasma bicarbonate (27 mEq.) should equal 130 mEq. per liter. In the case described the chlorides (95 mEq.) and bicarbonate (15 mEq.) totaled only 110 mEq. per liter. It would seem then that the osmolar concentration of electrolytes is less than normal. It must be remembered, however, that in prostatism with urinary retention the organic and inorganic acids accumulate in the extracellular fluid, combine with the available sodium, and thus cause a decrease in plasma bicarbonate (fig. 3). Thus the osmolar concentration of sodium may still be within normal limits. Occasionally a patient is found to have a decreased plasma concentration of electrolytes, as illustrated in figure 3.

The solutions to be selected, then, should correct the acidosis, bring the extracellular fluid volume up to normal, inhibit further tissue breakdown, and promote

diuresis. A liter of ⅙ molar sodium lactate is usually enough to compensate the metabolic acidosis so that the hyperpnea disappears. When sodium lactate is administered to a patient with hypocalcemia and acidosis, the patient should be observed closely for signs of tetany. If he shows such signs as carpopedal spasm or positive Chvostek's sign, then 10% calcium gluconate should be administered intravenously until the signs disappear.

The liter of sodium lactate should then be followed by 2 liters of a mixture containing one part of ⅙ molar sodium lactate and three parts of isotonic sodium chloride solution. This mixture closely resembles interstitial fluid and will serve to build up the extracellular fluid volume as well as to aid in correcting the acidosis.

Two liters of 5 or 10% glucose in water should then be given to provide for insensible loss of water, urinary water, diuresis, and sparing of protein catabolism as well as prevention of starvation ketosis. In most instances the fluids mentioned can be given intravenously at a rate of about 500 cc. per hour. If necessary, any isotonic electrolyte solution can be given subcutaneously or intramuscularly.

Many patients with decreased plasma bicarbonate levels do not have hyperpnea or dyspnea, i.e., their acidosis is compensated. In these cases it is better to correct the acidosis with a mixture of three parts isotonic sodium chloride solution and one part ⅙ molar or isotonic sodium lactate solution.[11] The serum bicarbonate level is restored at a slower rate than with ⅙ molar sodium lactate alone, but the lactate-chloride mixture serves to restore fluid volume deficits in addition to correcting the acidosis. Furthermore, the risk of inducing tetany with hypocalcemia is considerably less with the use of a lactate-chloride mixture.

It should be emphasized that electrolyte solutions are to be utilized primarily for correction of electrolyte distortions, disturbed electrolyte concentrations, and fluid volume deficits. The electrolyte solutions should not be used as a source of water to compensate for loss through the urine, lungs, and skin. Five or 10% glucose in water solution is the ideal fluid for supplying water parenterally. Occasionally, one encounters instances wherein large amounts of glucose solution have been used in an attempt to correct fluid volume deficits associated with decreased plasma electrolyte concentrations. The attempts invariably meet with disaster, since water intoxication is usually produced. The solution first enters the extracellular compartment and causes a marked dilution of the electrolytes present. Because of the hypotonicity that is produced, water will shift from the interstitial fluid into the cells, causing extracellular dehydration and intracellular overhydration. This will result in nausea, vomiting, muscle twitching, salivation, lacrimation, and oliguria.[10]

It cannot be emphasized too strongly that there is no one formula or group of formulas that can be used in determining the type and amount of fluid to be given in a particular case. Constant clinical and chemical evaluation of the patient is the only safe method of determination; however, there are a few generalizations that can be used as a rough guide in parenteral fluid therapy of the prostatic patient with urinary retention.

1. Adequate therapy can be carried out in most of the patients with the use of essentially two solutions. They are a 5 or 10% solution of glucose in water and a mixture of three parts isotonic sodium chloride and one part ⅙ molar sodium lactate solutions.

2. The chloride-lactate mixture is used to correct extracellular fluid volume deficits as well as acidosis. The glucose water solutions serve to provide water for urine and insensible loss of water through skin and lungs.

3. One-sixth molar sodium lactate solution is administered only when a patient demonstrates uncompensated metabolic acidosis characterized by dyspnea and hyperpnea; and it is used only in a quantity sufficient to dissipate the hyperpnea. The remaining compensated acidosis is treated with the chloride-lactate solution.

4. If the patient's glomerular filtration is improving as evidence by decreasing blood nonprotein nitrogen, then potassium therapy is started on the second or third day of parenteral feeding. A total of 4.0 gm. of potassium chloride per day is sufficient to prevent hypokalemia. The potassium can be given in the glucose-water solution in a concentration of 2.0 gm. of potassium chloride per 1,000 cc. of 5% glucose in water solution.

5. Except during the first 48 hours, when a large deficit of electrolyte is being replaced, the usual daily volume of fluids will not exceed 3,500 cc. One liter of the fluids is chloride-lactate mixture and 2.5 liters are glucose-water solution.

Wilson, Reisman, and Moyer [12] have studied a number of patients with chronic urinary retention in whom marked salt and water depletion developed following decompression of the bladder. They found that the depletion was due to marked losses in the urine (as is commonly seen in the recovery phase of acute renal injury). Fortunately, this type of response has been quite rare in our experience. Treatment should consist of replacement of the salt and water losses with lactate-chloride mixture until the kidneys have recovered.

After parenteral administration of fluids is no longer necessary, the patient should be observed carefully for signs of renal tubular insufficiency, which may manifest itself in polyuria, persistent hypochloremia, hyperchloremic acidosis, or hypochloremic acidosis. If the patient has nephritis in which he is losing sodium chloride without acidosis, he should have a daily intake of 2 to 4 gm. of sodium chloride in addition to the usual amount of sodium chloride in his diet. If the base-conservation mechanism of his tubules is not producing ammonium and hydrogen ions, then sodium bicarbonate, 3 to 4 gm. per day, should be prescribed. Both sodium chloride and bicarbonate are indicated if hypochloremic acidosis tends to develop.

The type of patient found in group 2 is not subjected to prostatectomy until the kidneys are able to maintain homeostasis. As stated previously, in some cases cystostomy drainage may be necessary for six weeks before the azotemia and acidosis have completely disappeared.

11. Darrow, D. C., and Pratt, E. L.: Fluid Therapy: Relation to Tissue Composition and Expenditure of Water and Electrolyte, report of Council on Foods and Nutrition, J. A. M. A. **143**: 365-373 (May 27), 432-439 (June 3) 1950.

12. Wilson, B.; Reisman, D. D., and Moyer, C. A.: Fluid Balance in Urological Patient: Disturbances in Renal Regulation of Excretion of Water and Sodium Salts Following Decompression of Urinary Bladder, J. Urol. **66**: 805-815, 1951.

The patient can usually be sent home to complete his recovery process once he is well started on oral feedings. If the patient's serum calcium is low and phosphorus high, calcium lactate, vitamin D, aluminum hydroxide gel (Amphojel) and Shohl's solution (containing 98 gm. of sodium citrate and 140 gm. of citric acid per liter of distilled water) can be prescribed. The aluminum hydroxide gel serves to prevent absorption of phosphorus from the intestine and thus will tend to reduce the serum phosphorus. Shohl's solution is used to aid in absorption of calcium lactate from the intestine and also to provide available base to the body.[13]

SUMMARY

Lower urinary tract obstruction by an enlarged prostate often leads to aberrations in the fluid and electrolyte balance of the body. The role of back pressure in the production of the renal dysfunction leading to electrolyte abnormalities is discussed. An outline of the types of electrolyte problems encountered in patients with urinary retention is presented. The various repair solutions utilized in the correction of the electrolyte disturbances and the rationale for their use are indicated.

13. Albright, F., and Reifenstein, E. C., Jr.: The Parathyroid Glands and Metabolic Bone Disease, Baltimore, Williams and Wilkins Company, 1948, p. 234.

FLUID AND ELECTROLYTE BALANCE IN BURNS

Capt. Eric Reiss, Lieut. Jerry A. Stirman, Major Curtis P. Artz, Capt. John H. Davis
and
Col. William H. Amspacher, (MC), U. S. Army

No insult to the body equals a burn in intensity. A severe, untreated burn causes death by initiating incredibly large and rapid shifts of fluids. In burns as well as in other conditions associated with fluid derangements, present day therapy is based on the assumption that optimal care consists of the administration of fluids at the same rate and in the same volume and composition in which they are lost. For instance, the best therapy for a patient who loses 500 cc. of blood during an operation is the administration of the same quantity of blood as rapidly as it is being lost.

During the past 10 years, experimental and clinical data have yielded valuable information concerning the volume and rate of fluid losses in burns. Knowledge concerning the composition of fluid losses in burns remains fragmentary, however, and, to a large extent, conjectural. Treatment is correspondingly imperfect. Despite the progress that has been made in the initial treatment of burns, most patients who have deep burns over more than 50% of the body surface still die. Death in many of these patients is a direct result of fluid and electrolyte shifts. In contrast, less severely burned patients generally respond well to present day treatment.

The purpose of this presentation is (1) to review briefly and critically some facts and speculations concerning the fluid and electrolyte shifts in the severely burned patient and (2) to outline a regimen that has proved valuable in the treatment of a large series of patients.

PHYSIOLOGICAL CONSIDERATIONS

Volume of Fluid Losses.—The volume of fluid lost from the blood and from the interstitial fluid of unburned tissues depends largely on the extent of body surface burned and the depth of the burn. The total surface area involved is best expressed in terms of percentage of body surface and can best be ascertained with sufficient accuracy by the use of the "Rule of Nines." According to this rule, the body is divided into areas representing 9% of the body surface or multiples thereof, as follows: the head 9%; each upper extremity, 9%; each lower extremity, 18%; the anterior trunk, 18%; and the back, 18%. This simple means of rapidly estimating the extent of a burn is extremely valuable and should be committed to memory by every physician.

That the fluid losses (and therefore the fluid requirements) of burned patients are definitely related to the extent of the burn was established beyond doubt by the work of Cope and Moore; their documented experience forms the foundation on which modern treatment is based.[1] The depth of burn as a factor determining fluid losses is equally important but not as well appreciated by the medical profession. Burns injure tissue cells and capillary walls. The intensity of the heat source and the duration of the tissues' exposure to heat determine the depth of burn and the total quantity of tissue damaged in any particular area. Although the true depth of a burn defies clinical diagnosis, it is certain that skin is not the only tissue that is affected by burning. In partial thickness burns (second degree), the epithelium is incompletely destroyed, yet capillary injury extends well into the subcutaneous tissue. Full thickness burns (third degree) can be associated with widespread, deep tissue injury that profoundly influences the fluid needs of the patient. The severity of injury ranges from necrosis in the more superficial structures to less severe damage in tissues that are farther removed from the source of heat. It is well, therefore, to think of a burn as three dimensional trauma rather than as trauma that involves merely the surface. Unfortunately, inspection of a burn frequently yields a misleading impression of the magnitude of fluid losses. The exudate that weeps so copiously from the surface of a recent partial thickness burn is but a small fraction of the total loss: the major loss occurs in the tissues and is concealed from vision until the wound begins to swell a few hours after injury. In full thickness burns, visible exudation is completely absent, and the hard, dry, eschar, which is characteristic of full thick-

From the Surgical Research Unit, Brooke Army Hospital.
Read at the Sixth Clinical Session of the American Medical Association, Denver, Dec. 3, 1952.

Owing to lack of space, some of the bibliographic references have been omitted from THE JOURNAL but will be included in the authors' reprints.

1. Cope, O., and Moore, F. D.: Redistribution of Body Water and Fluid Therapy of Burned Patient, Ann. Surg. **126**: 1010, 1947.

ness injury, often prevents swelling. Nevertheless, it is this type of injury with a dry surface that poses the most vexing problems and is in need of more intensive supportive therapy than the profusely oozing partial thickness burn.

Rate of Fluid Losses.—The most rapid loss of fluids occurs in the first few hours after burning. By the sixth to eighth hour, a large portion of the fluid losses has occurred; thereafter, the rate of loss is sharply reduced. When wound edema reaches a maximum in approximately 48 hours, fluid losses into the wound virtually cease. Clinically, the rapid infusion of fluids during the first six to eight hours and the subsequent decline in the rate of fluid administration has proved very effective.

Composition of Fluid Losses.—The problem of the composition of fluid losses bears an important relationship to the nature and location of fluid shifts. An abundance of experimental work has failed so far to elucidate this crucial problem. Only this much is clear from what has already been said about the three dimensional character of the burn wound: burn exudate must be a mixture of heterogeneous fluids. Varying degrees of capillary and tissue damage must result in fluid losses of varying composition.

Proteins: From inspection of blister fluid it might be surmised that burn exudate resembles plasma. With the use of radioactive dyes, Cope and Moore proved that the capillaries in burned areas are abnormally permeable to proteins.[2] In subsequent studies, Cope and associates studied the concentration and partition of proteins in the lymph and plasma of burned dogs.[3] They noted an early increase in the plasma protein concentration and a high albumin-globulin ratio in the lymph. The increasing plasma protein concentration indicated a more rapid loss of water than of proteins, and the high albumin-globulin ratio in the lymph pointed toward the more rapid loss of the smaller albumin molecules than of the larger globulin molecules. This important series of experiments forms the rational basis for the use of colloid solutions in the early treatment of burns.

Electrolytes: Unfortunately, the true composition of burn exudate is reflected neither in lymph nor in blister fluids. A study of lymph may give a clue as to the composition of the interstitial fluid in burned areas, but some evidence has been adduced that shows that the injured tissue cells play an important and active part in the fluid shifts. When Fox burned mice and analyzed the burned as well as unburned tissues, he noted the extrusion of potassium and accumulation of sodium in the burned tissues and the uptake of potassium and release of sodium in the unburned tissues.[4] The loss of sodium into the burned tissues was so great that it could cause hypotonicity of the extracellular fluid, which in turn would result in the shift of large quantities of water into the cells of unburned tissues. If Fox's interpretation of his data is correct, large volumes of fluid could be lost not only at the site of burn but also in uninjured regions away from the area of injury. Indirect support of fluid losses remote from the burn is furnished by the experiments of Scott, who was unable to correlate the volume of fluid that accumulated in the area of injury with the death or survival of experimental animals.[5] The effectiveness of salt solutions in the treatment of burned rodents has been established.[6] Evidence regarding the relative effectiveness of isotonic and hypertonic salt solutions is conflicting. In man, the limits of effectiveness of salt solutions has yet to be defined, but it appears certain that most patients who have burns involving 20 to 25% of the body surface can be adequately treated by the use of salt solutions without colloids.

Red Cells: Red cell destruction occurs to a variable extent after burning. Many red cells that are trapped in the area of burn are directly destroyed by heat. Some escape direct destruction but become more fragile and succumb subsequently (delayed hemolysis).[7] The phenomenon of sludging, which has been described by Brooks, may also contribute to the functional removal of large numbers of red cells from the circulation.[8] The magnitude of red cell lysis is largely dependent on the depth of burn: it is greatest in deep, extensive burns and, for practical purposes, insignificant in partial thickness burns, even in those that extend over large areas of the body surface.

Therapeutic Implications: Because our understanding of the pathological physiology of burns is incomplete, our present treatment of the fluid and electrolyte shifts is not altogether satisfactory. Our competence is greatest in appraising the volume and rate of fluid losses; it is least in appraising their composition.

Plasma proteins are of importance in the maintenance of a normal circulating volume and, since they are lost into the burn tissues, their replacement in some form or another appears necessary. The plasma protein concentration in severely burned patients almost always decreases to 5 gm. per 100 cc. or less, regardless of the quantity of blood and plasma that is given. As long as the injured capillaries permit leakage of colloidal particles into the interstitial spaces of burned tissues, the administration of colloid solutions is probably of only limited value in increasing the circulating volume.

Solutions that contain sodium are certainly required in treatment, but it remains to be conclusively shown whether these solutions are by themselves capable of maintaining the blood volume in extensive, deep burns in man. It is possible that massive infusions of solutions containing sodium result in the mobilization of protein stores from the interstitial spaces of unburned tissues and from other stores and that sufficient protein enters the circulation from these sources to sustain the circulating volume.

Only this much appears certain at this time: Electrolytes, whole blood, and colloids are required in the treatment of severe burns. Selection of fluids as regards their composition and total and relative volumes is influenced by the severity of injury and by the physiological status of the patient.

2. Cope, O., and Moore, F. D.: Study of Capillary Permeability in Experimental Burns and Burn Shock Using Radioactive Dyes in Blood and Lymph, J. Clin. Investigation **23**: 241-257, 1944.

3. Cope, O.; Graham, J. B.; Moore, F. D., and Ball, M. R.: Nature of Shift of Plasma Protein to Extravascular Space Following Thermal Trauma, Ann. Surg. **128**: 1041, 1948.

4. Fox, C. L., Jr., and Baer, H.: Redistribution of Potassium Sodium and Water in Burns and Trauma and Its Relation to Phenomena of Shock, Am. J. Physiol. **151**: 155-167, 1947.

6. Rosenthal, S. M.: Experimental Chemotherapy of Burns and Shock: III. Effects of Systemic Therapy on Early Mortality, Pub. Health Rep. **58**: 513-522, 1943.

TREATMENT

General Considerations.—All of the mechanical and pharmacological means that have been used in an attempt to decrease the abnormal capillary permeability in burned tissues have failed to influence the loss of fluids. In a series of carefully controlled experiments, Rhinelander observed that compression of the burn wound does not appear to limit the total fluid losses but merely to translocate the losses from the burn wound to the surrounding tissues.[9] This negative evidence is of practical importance, since pressure that is applied over the burn wound in an effort to limit extravasation of fluid may cause serious impairment of circulation in the affected part. Although corticotropin and cortisone influence capillary permeability in areas of inflammation, their ineffectiveness in limiting the leakage of proteins from the capillaries of the burned tissues has been demonstrated, experimentally and clinically.[10]

Although the extent and depth of the burn are by far the most important factors determining the fluid requirements, other factors, including the age of the patient and the location of the burn, must also be taken into account in any plan of therapy. In contrast to the experience of others, our limited experience in the treatment of burned children has indicated that they generally respond well to treatment in the early postburn period. Investigators who have had experience in the treatment of elderly patients have stated that those 60 years of age or older have less chance for survival than younger patients.

It is well to define again the limitations imposed by treatment based on our inadequate understanding of fluid shifts: patients who have third degree burns of more than 50% of the body surface rarely survive for more than 10 days, even under the most skillful medical supervision. The principal factor determining survival appears to be the extent of third degree involvement rather than the total area burned.

Replacement Solutions.—A well-cooled solution containing 3 gm. of sodium chloride and 1.5 gm. of sodium bicarbonate per liter can be administered orally and is well tolerated by most patients.[11] This solution contains only 70 mEq. of sodium per liter and is, therefore, hypotonic with respect to this ion. Isotonic electrolyte solutions, orally administered, are unpalatable and poorly tolerated.

Since a 0.9% solution of sodium chloride contains an excessive concentration of electrolytes, particularly chloride, some type of "balanced electrolyte solution" is preferred in the treatment of burns as well as in the treatment of most conditions associated with a deficit of extracellular fluid volume. Lactated Ringer's (Hartmann's) solution is an acceptable solution that contains, in addition to minute amounts of other ions, 130 mEq. of sodium and 109 mEq. of chloride per liter. The high concentration of available bicarbonate in lactated Ringer's solution offsets the tendency towards acidosis that is frequently seen in the early postburn period. If isotonic sodium chloride solution is used exclusively to meet the sodium requirements of an extensively burned patient, low plasma levels of bicarbonate and very high levels of chloride are frequently encountered.

Colloid Solutions.—Plasma, plasma expanders, and blood are the colloid solutions most commonly used in burns. Plasma that is available to the armed forces causes viral hepatitis of the homologous serum type in a high percentage of patients. In our experience, hepatitis occurred in one out of every five patients who had received plasma, and we have recently observed two fatalities from this complication. For this reason, we never use plasma. Experience with dextran, polyvinylpyrrolidone, and the gelatins indicates that the colloid effectiveness of these plasma expanders is equal or superior to that of plasma.

Signs and Symptoms of Fluid Deficiency.—The clinical picture of burns is peculiarly deceptive, for a patient may appear to be in good condition even though disasterous derangements are imminent. Close clinical observation is of the greatest value in judging the adequacy of past treatment and planning for future treatment. Ravenous thirst, vomiting, restlessness, disorientation, mania, and increase in pulse rate, a decrease in blood pressure, collapsed veins, and oliguria are indications that therapy has failed to keep pace with fluid losses. Severely burned patients frequently have abdominal distention, nausea, and vomiting during the first 48 hours. The ingestion of fluids may aggravate vomiting, and this may cause an additional loss of electrolytes via the gastric juice. It is particularly important to interpret restlessness and disorientation as signals for the intensification of therapy and not as indications for the administration of narcotics. Changes in the pulse rate and blood pressure are not altogether reliable, since they may not occur until the patient's condition becomes critical. Although all of the signs and symptoms of deficiency are important, the most valuable single index in determining the adequacy of therapy is the rate of urinary output.

Specific Regimen of Therapy.—In general, burns that involve less than 20% of the body surface in adults require only a minimum of supportive therapy. Colloid solutions are not necessary, and fluid requirements are satisfactorily met by electrolyte solutions given orally and/or intravenously.

In more extensive burns, a 15 to 18 gage metal cannula or plastic tube, firmly secured in a vein, and an indwelling catheter in the bladder are absolutely essential for adequate therapy. Definitive local care must be postponed until the patient's general condition is stabilized. A rapidly applied emergency dressing, whose function is to protect the wound from contamination and to lessen pain, is all that is required. If pain or anxiety is severe, a small dose of a narcotic may be given. If possible, this should be given intravenously, since absorption from subcutaneous deposits is poor in the presence of impending or established circulatory collapse. Not infrequently, several large doses of narcotics are given subcutaneously without effecting pain relief; after reestablishment of good circulation by fluid therapy, simultaneous absorption of several doses of the drug may lead to serious central nervous system depression.

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9. Rhinelander, F. W.; Langohr, J. L., and Cope, O.: Explorations into Physiologic Basis for Therapeutic Use of Restrictive Bandages in Thermal Trauma: Experimental Study, Arch. Surg. **59**: 1056 (Nov.) 1949.

10. Wight, A.; Weisman, P. A.; Rovit, R. L., and Cope, O.: Adrenal Hormones and Increased Capillary Permeability of Burns, A. M. A. Arch. Surg. **65**: 309-317 (Aug.) 1952.

11. Moyer, C. A.: Recent Advances in Chemical Supportive Therapy of Thermal Injury, Texas State J. Med. **45**: 635, 1949.

Treatment requirements of an extensively burned patient must be selected for the individual patient against a background of the many variables that have been mentioned. Rules of thumb or formulas cannot be expected to predict accurately the requirements for all patients. Nevertheless, some yardstick for roughly planning fluid therapy during the first 48 hours is useful. For this purpose, a modification of the formula proposed by Evans has proved valuable.[12] The severely burned patient requires, in the first 24 hours, approximately 0.5 cc. of colloid solution and 1.5 cc. of a balanced electrolyte solution per 1/100 of the body surface burned per kilogram of body weight. In addition, adults require 1,000 to 2,000 cc. of either an electrolyte solution or water (figure).

Since the relationship between fluid requirements and percentage of burn is not linear throughout, fluid requirements of burns involving more than 50% of the body surface should be calculated as though only 50% had been burned. Unless this limitation is imposed on the use of the proposed formula, an excessive estimate of

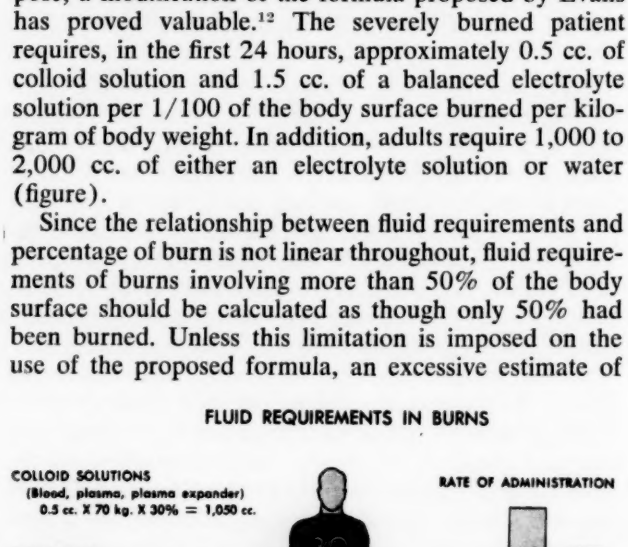

Illustration of method of estimating fluid and electrolyte requirements for the first 48 hours after injury. Colloid and electrolyte needs are roughly determined by the extent of burn and the size of the patient. Details are given in the text.

fluid requirements is made. In general, adults should not receive more than 10,000 cc. of fluids in the first 24 hours, regardless of the extent of the burn and the body weight. In the second 24 hour period, fluid requirements, qualitatively and quantitatively, are approximately one-half to three-quarters those of the first 24 hours.

If the patient can tolerate fluids given orally, a solution containing sodium bicarbonate and sodium chloride rather than water should be given. Administration of large amounts of water not containing electrolytes, by any route, carries with it the danger of dilution of the extracellular fluid. Dilution results in the shift of large quantities of water into the cells and is reflected clinically as the syndrome of "water intoxication."[11] The more serious the injury, the more jealously must the intake of electrolyte-free water be guarded. For very extensive, deep burns, we propose complete restriction of water intake in the first 24 hours, unless the infusion blood and a balanced electrolyte solution, in proper amounts, fails to sustain an adequate urine flow; only under this condition should free water be given, and then only in small amounts. In the second 24 hour period, less stringent water restriction is required, and thereafter water intake should be encouraged.

Whole blood is rarely required in partial thickness burns. When partial thickness injury extends over more than 30% of the body surface, some colloid in the form of a plasma expander is usually required. Whole blood is indicated in full thickness burns of more than 20% of the body surface. The larger the area of third degree burn and the deeper the burn, the more urgent is the need for blood transfusions. To what extent, if any, high hematocrit readings (hemoconcentration) contraindicate the use of whole blood in deep extensive burns has not been established. Serious red cell deficits and hemoconcentration frequently coexist because water and electrolytes are lost in greater quantity than red cells. Hemoconcentration causes increased blood viscosity.[13] Although a high blood viscosity has not been proved harmful, it appears likely that a high hematocrit does not serve any beneficial purpose. In the presence of a high hematocrit, whole blood should not be used unless large quantities of electrolyte solutions are given simultaneously. Whole blood may be administered when the hematocrit is at a level of 60 or below and decreasing, but it must be remembered that a high increasing hematocrit indicates primarily the need for electrolyte solutions. The need for whole blood is particularly striking in patients who have deep, extensive burns, who show signs of peripheral circulatory collapse, and who, at the same time, have normal or low hematocrit levels and fail to improve when electrolytes are given. If whole blood is not available, it is still possible to treat satisfactorily many deeply and extensively burned patients during the first 48 hours with the use of electrolytes and plasma expanders. The clinical course of these patients is generally less satisfactory than that of patients who are treated with whole blood initially.[14]

To keep pace with the fluid losses, approximately one-half of the fluid requirements of the first 24 hours should be given in the first eight hours, one-quarter in the subsequent eight hours, and one-quarter in the last eight hours. Clinical signs and symptoms and occasional hematocrit determinations influence the volume, composition, and rate of fluid administration. The urine volume should be measured every hour. An hourly output of 30 to 50 cc. of urine is satisfactory. A persistent urine flow of less than 30 cc. per hour is an indication for more rapid administration of fluids. A urine volume of more than 100 cc. per hour, on the other hand, indicates that the rate of fluid administration should be decreased. Although so-called "lower nephron nephrosis" (acute renal insufficiency) has been described after burns, we could not find a single instance of this complication in a series of 500 burn patients, 20 of whom died.[15] Oliguria and anuria in the first 48 hours after burning are nearly always caused by inadequate therapy and respond to intensification of therapy. It must be remembered, however, that in badly burned patients who have not had

12. Evans, E. I., and others: Fluid and Electrolyte Requirements in Severe Burns, Ann. Surg. **135**:804-817, 1952.

13. Quinby, W. C., Jr., and Cope, O.: Blood Viscosity and Whole Blood Therapy of Burns, Surgery **32**: 316-325, 1952.

14. Abbott, W. E.; Hirshfield, J. A., and Meyer, F. L.: Metabolic Alterations Following Thermal Burns: V. The Use of Whole Blood and Electrolyte Solution in Treatment of Burned Patients, Ann. Surg. **122**: 678, 1945. Evans, E. I., and Bigger, I. A.: Rationale of Whole Blood Therapy in Severe Burns: Clinical Study, ibid. **122**: 693, 1945.

treatment for many hours, the urine flow may not increase for many hours after institution of therapy. In these patients, fluid restriction in the mistaken belief that acute renal insufficiency exists results in an inexorably fatal outcome.

By the use of the regimen outlined, patients who are so severely burned that their chances for recovery are practically nil may survive for several days. If therapy is to be successful, advantage must be taken of the more or less predictable volume and rate of fluid losses. In this respect, the physician has a therapeutic opportunity that is rarely encountered in other diseases characterized by disturbed water and electrolyte distribution. If judicious treatment is instituted within a few hours after injury, the signs and symptoms of fluid derangement can frequently be prevented.

Fluid therapy after 48 hours is less well defined than it is in the initial period. According to our studies and experience, we must abandon the old concept that diuresis occurs after 48 hours as wound edema is resorbed and that, at the time of diuresis, fluid administration must be drastically reduced lest the circulation be overloaded. Dramatic diuresis was observed when burn patients were given fluids far in excess of the volumes now recommended, but when a regimen such as that proposed by Evans or our modification thereof, is employed the rapid mobilization of fluids is exceptional. If it occurs, it is a reflection of excessive fluid therapy prompted, in most instances, by overestimation of extent and depth of burn. A gradual increase in urinary output is more commonly seen. "Fluid redistribution" may be a better term to describe the changes that occur after 48 hours than "fluid resorption."

Therapy is guided almost exclusively by clinical signs and symptoms. Sufficient quantities of fluid should be given to assure good turgor of the unburned skin, fullness of veins, and a good tongue volume. Surprisingly large amounts of fluid may be required to accomplish this. After 48 hours, the urinary output becomes a totally unreliable sign of the adequacy of therapy, for serious water and salt deficits may develop in the presence of an adequate urine flow. The large quantities of nonprotein nitrogenous products released from the burned tissues (and possibly from other sources) demand excretion in the tubules of the kidney and act as osmotic diuretics.

Potassium excretion is high and subsides slowly over a period of weeks. Since severely burned patients tolerate only a very limited food intake during the first week, it is advisable to give potassium by mouth, beginning on the third or fourth day. Three grams of potassium chloride or, preferably, potassium phosphate in orange juice can be given by mouth three to four times a day until a normal diet is ingested.

Unfortunately, the factors that control fluid redistribution remain obscure. Until the fourth to the sixth postburn day, the serum levels of sodium, potassium, and chlorides usually remain within normal limits. At that time, the serum sodium level commonly decreases to 130 mEq. per liter or below, and we have observed that, concomitantly, the patient's clinical condition often deteriorates, as evidenced by high fever, tachycardia, tachypnea, and mental confusion. Low serum sodium levels are observed in metabolic adjustments to injuries other than burns and in a variety of medical diseases, including congestive heart failure, cirrhosis, and nephrosis. In burns, fluid redistribution sometimes proceeds in a manner reminiscent of these diseases. That a cause and effect relationship exists between the low serum sodium level and the patient's deteriorating clinical state is not necessarily true, but this possibility distinctly exists and must be studied further. Patients who are not too severely burned usually recover from this mysterious syndrome in several days; clinical improvement is not infrequently associated with diuresis of water and sodium. Those who are more seriously burned succumb despite the many heroic measures that have been employed in treatment.

SUMMARY

The complex nature of water and electrolyte shifts after burning is not yet fully understood. Although the volume and rate of fluid losses can be gaged with reasonable accuracy, the exact composition of fluid losses is as yet unknown and imposes serious handicaps in treatment. Fluid and electrolyte redistribution is a gradual process. It is characterized clinically by fever and tachycardia and occurs at approximately the time when the serum sodium level decreases. Burns involving 20% or less of the body surface can be managed satisfactorily with oral administration of electrolyte solutions, supplemented by small quantities of electrolytes, intravenously. In severe burns, a rough guide for therapy is provided by the formula in which 0.5 cc. of colloid and 1.5 cc. of electrolyte per 1/100 of body surface burn per kilogram of body weight and an additional 1,000 to 2,000 cc. of either an electrolyte solution or water are advocated. In the second 24 hour period, one-half to three-quarters of these amounts are usually required to satisfy fluid requirements. After 48 hours, clinical signs and symptoms govern fluid therapy. Because of the high losses of urinary potassium, beginning on the third day, administration of oral potassium solutions is advised.

ADDENDUM

Eight burn patients have died on our service since this paper was submitted for publication. Two of these patients had a clinical course and renal lesions compatible with a diagnosis of lower nephron nephrosis.

Suicide Rate at Record Low.—The suicide rate among industrial policyholders of the Metropolitan Life Insurance Company established an all-time low last year. The rate for 1952, namely 5.6 per 100,000 at ages 1 to 74 years, was 10% less than that in 1951; the previous low of 6.3 per 100,000 was recorded in 1945. . . . With the close of World War II, the suicide rate took an upward turn. The wartime motivations that usually lower the suicide rate were gone; many ex-servicemen experienced difficulties in readjusting to civilian life, and the tempo of industrial activity slackened. It was not possible to forecast then how long the suicide rate might continue upward or how high it would go. There was little comfort in looking back at the experience following World War I, because the upward trend in suicide which began in 1920 continued through the early 1930's. Fortunately, the pattern of the period after World War I has not been repeated in the experience since 1945. The fact that the suicide rate is now at a record low is a good index of the psychological and economic well-being of our people.—Suicide Rate at Record Low, *Statistical Bulletin,* Metropolitan Life Insurance Company, May, 1953.

PRECAUTIONS IN PEDIATRIC IMMUNIZATION PROCEDURES

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During the past decade, the simultaneous immunization against diphtheria, tetanus, and pertussis has become quite well established on laboratory and clinical evidence. To retard the elimination of antigen (DTP) from the body and to enhance antitoxin and antibody development, various forms of aluminum have been used as adjuvant. Most private patients are now adequately protected by the customary primary series of three or four monthly doses, and subsequent recall (stimulating or booster) doses. Needless deaths due to pertussis are still occurring, however, in infants and children from families with low incomes and orphanages in congested cities and in rural areas. To reach these children, mass immunization clinics should function at well baby clinics, primary schools, and mobile units. The diverse difficulties encountered in the execution of these immunization procedures are problems due to earlier immunization, febrile reactions, alum cyst, postinoculation encephalopathy, paralytic poliomyelitis of the injected limb, and unfavorable results caused by the technique of mass immunizations. This paper deals with precautions in the solution of these problems.

EARLIER IMMUNIZATION

In 1925, Lovett and Hektoen [1] wrote: "Of all contagious diseases [whooping cough] is the most likely to affect the youngest members of the family; and herein . . . lies its chief danger. Even the tiny baby is not immune; for many cases occur . . . between the ages of one and three years." Kahn,[2] working with animals, made the fundamental discovery that "The capability to develop immunity is possessed to a considerably greater extent by the adult animal than by the young animal, and a given dose of antigen per kilogram of body weight that will produce marked immunity in the former animal may produce but mild immunity in the latter." I found, in 1933, that pertussis vaccine in an isotonic sodium chloride solution (in a total dosage of 80 billion Hemophilus pertussis, divided into three subcutaneous doses) conferred prolonged active immunity to infants after the age of 6 months but failed to protect when administered during the first months of life.[3] Pertussis occurred seven times more frequently in the latter group. Twelve years later, Sako, Treuting, Witt, and Nichamin [4] showed that alum precipitated pertussis vaccine protected most younger infants and prevented deaths due to pertussis when the disease was contracted later. Recently McComb and Trafton [5] reported that aluminum phosphate as adjuvant in DTP produced good protection and minimal systemic and local reactions.

The American Academy of Pediatrics [6] Committee on Immunization and Therapeutic Procedures recommends three monthly doses of slow absorbing (alum containing) DTP, starting at the age of 3 months, and the first recall dose one year after completion of the primary series. When begun before the third month of life, four monthly doses are advised. Some health departments, including those of Chicago and Evanston, and some physicians prefer to administer four monthly doses when the primary series is started before the 6th month. Three monthly doses are given when the primary series is started after the age of 6 months; their recall dose is not administered until several years after completion of the primary series.

PREVENTION OF FEBRILE REACTIONS AND ALUM CYSTS

Slow absorbing (alum-containing) DTP is preferred. It produces earlier, higher, and longer sustained immunity responses than did pertussis vaccine in isotonic sodium chloride solution, and, because of delayed absorption, febrile reactions are usually less frequent and milder. To reduce the incidence and severity, the mother should be instructed to keep the infant more quiet after injection and, if the infant is restless or feverish, to give an adequate dose or two of aspirin. Water should be offered repeatedly, a feeding or two reduced in volume, and excessive covers and sun avoided.

Deposition of alum along the needle tract produces regional fat necrosis, which terminates as an alum cyst or sterile abscess. When the individual dose was contained in a volume of 1 cc., alum cyst followed 2% of the injections. Since the concentration of the individual dose of slow absorbing DTP into a volume of 0.5 cc., and improvement of adjuvant and administration technique, the incidence of alum cyst has decreased to 0.12%.

In children under 3 years of age, alternate lateral gluteal areas (starting with the left proximal area) are preferred sites for the administration of alum-containing DTP antigens. The prone infant is held firmly, preferably by the mother, to lessen crying and squirming. Deviation of the needle from its original course seems to increase the likelihood of alum cyst formation. Termination of each deeply administered dose with an air bubble (0.1 cc.) is an added precaution. To prevent seepage, the needle should remain in place for a few seconds before it is quickly withdrawn. As a final precaution, the site should be promptly and gently massaged with sterile gauze. Subsequent doses (or penicillin) should not be administered at the site of a previous dose. After the 3rd

This study was aided by a grant from Parke, Davis & Company, Detroit.

From the Evanston Hospital Whooping Cough Research Laboratory, Northwestern University Medical School, Chicago.

Read in part before La Sociedad Cubana de Pediatria, Havana, Cuba, Feb. 24, 1953.

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year, alternate upper arms may be used, starting with the left deltoid area. To lessen alum seepage, the needle is directed distally; after withdrawal, the area is covered with sterile gauze and three distally directed massage strokes are applied. Occasionally a deep, circumscribed alum nodule may be palpated for a month or longer. Adherence to these precautions almost completely eliminates alum cyst.

POSTINOCULATION ENCEPHALOPATHY

Byers and Moll [7] were the first to collect cases of encephalopathy following prophylactic pertussis vaccine injections. Toomey [8] augmented the number by sending a questionnaire to hundreds of pediatricians. The triad—fever, convulsions, and irreversible central nervous system changes—resembles that encountered not infrequently in cases of severe pertussis. In defense of pertussis vaccine it should be emphasized that this triad has been reported also after the administration of smallpox vaccine, diphtheria toxoid, typhoid vaccine, and influenza vaccine. Pertussis vaccine in isotonic sodium chloride solution was more frequently implicated than was slow absorbing DTP. The remainder of the vaccine in the vials caused no adverse symptoms when administered to other infants. Antigens of eight commercial biological laboratories were involved. Only once was a severe reaction reported after administration of a recall dose. Central nervous system instability was recorded in a high percentage of the family histories. Pediatricians frequently encounter convulsions in infants and young children at the onset of febrile infections such as exanthema subitum, tonsillitis, and pyelitis. Any child with a history of convulsions should not be given the injection. Should immunization seem desirable, however, fractional doses (0.2 to 0.3 cc.) may be tried at monthly intervals until the full total dosage has been administered. DTP administration should be deferred in premature and frail, nonthriving infants and in those with fever or a pustular infection of the skin or ears.

PARALYTIC POLIOMYELITIS OF INJECTED LIMB

In an editorial [9] "Poliomyelitis and Prophylactic Immunization" THE JOURNAL pointed out that paralysis of an injected limb was reported in several countries after the injection of various antigens. THE JOURNAL states: "Pending the results of further studies, the concept is prevalent in some quarters that children in whom paralytic poliomyelitis develops may have the pattern of their paralysis altered by injection of diphtheria and/or pertussis antigens during an epidemic. . . . Postponement of such immunizations for a few months, until the end of the epidemic, would appear particularly discreet . . . when these diseases are not unduly prevalent in the community at the same time as the poliomyelitis epidemic." Faber [10] collected reports of cases following the administration of diphtheria toxoid, penicillin, typhoid vaccine, cholera vaccine, and smallpox vaccination. It seems unlikely that these diverse medicaments might harbor poliomyelitis virus. One of the theories infers that these patients harbored latent poliomyelitis virus and that the trauma of the antigen induced the disease and localization of the paralysis. Another more likely theory assumes that inadequate sterilization of syringe or needle, or subsequent contamination of sterile syringe or needle with poliomyelitis virus, might have occurred from the physician's fingers or the patient's skin site or fingers. Faber stresses that syringes and needles used for injections should be sterilized by use of the autoclave or, if this is not possible, boiled for 20 minutes. His antiseptic for vial cap and skin site is 2% tincture of iodine.

The 1952 Report of the Committee on Immunization and Therapeutic Procedures of the American Academy of Pediatrics [6] cautions: "An outbreak of poliomyelitis in one's community is a signal for deferring elective immunization procedures in individuals over the age of six months. Primary immunization and/or recall injections obviously cease to be elective procedures when outbreaks of diphtheria, pertussis, typhoid or smallpox coexist with that of poliomyelitis." Physicians should heed these monitions.

STERILIZATION OF SYRINGES AND NEEDLES

Regardless of whether an injection is given in a physician's office, at home, or at mass immunization clinics, sterilization of syringes and needles in the hot oven should be the method of choice. It has been used exclusively at the Whooping Cough Research Laboratory for more than 25 years, during which time over 15,000 infants and children have been inoculated, with no instance of convulsion, postinoculation encephalopathy, or needle poliomyelitis reported. Needles and syringes remain sterile longer and are less readily contaminated than when sterilized by boiling.

Syringes (1 cc.) and needles (25 gage, ½ in.) rinsed in distilled water and dried are best sterilized in a dry, hot air oven maintained at 160 C (320 F) for one hour. A small, inexpensive gas-heated kitchen oven, an electric oven with an oven thermometer, or an electrically heated sterilizer with automatic temperature control is satisfactory. Supplies should be in the oven before the heat is turned on and should not be removed until the oven has cooled. Dried syringes (with attached needle) are placed in heavy-walled Pyrex tubes with gauze-covered cotton in the bottom and firm gauze-covered cotton plugs to facilitate handling. Extra needles, for use during office hours, are sterilized, two to four at a time, in smaller Pyrex tubes. Needles (20 gage), to be left in the vial to facilitate removal of each dose during mass immunizations, are sterilized singly in Pyrex tubes. When the DTP vial is empty, the needle is aseptically transferred to another vial after the cap has been cleansed with alcohol or other antiseptic. For use in mass immunization clinics, extra needles (point downward), cushioned on gauze, 40 to a Monel metal container, should remain sterile for weeks when sealed with adhesive tape. The same sterile syringes may be used without risk of contamination if needles are aseptically replaced with sterile forceps (tips under sterile towel or submerged in antiseptic when not in use) (see figure).

The British Medical Research Council [11] published "The Sterilization, Use and Care of Syringes" in 1945.

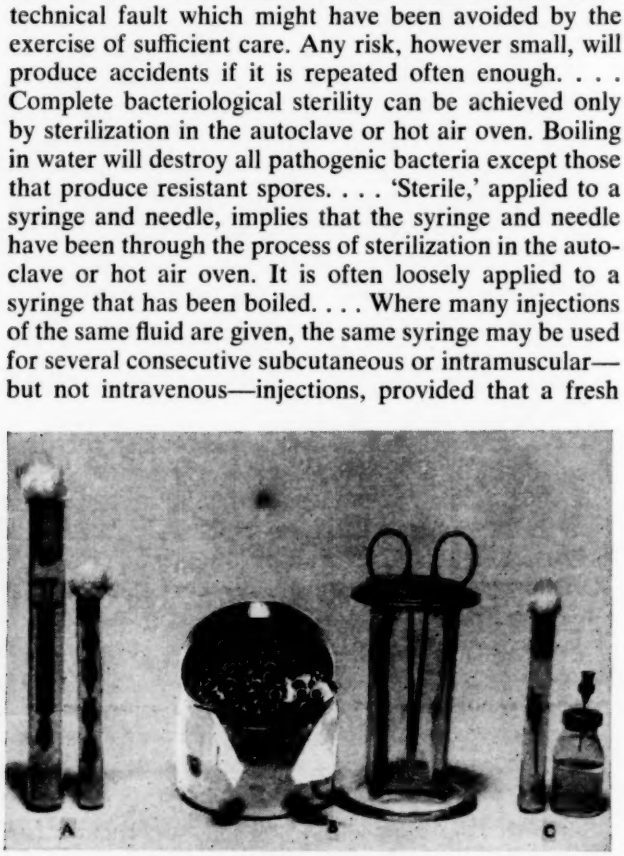
7. Byers, R. K., and Moll, F. C.: Encephalopathies Following Prophylactic Pertussis Vaccine, Pediatrics **1**: 437-457 (April) 1948.

8. Toomey, J. A.: Reaction to Pertussis Vaccine, J. A. M. A. **139**: 448-450 (Feb. 12) 1949.

9. Poliomyelitis and Prophylactic Immunization, editorial, J. A. M. A. **144**: 240-241 (Sept. 16) 1950.

10. Faber, H. K.: Postinoculation Poliomyelitis, editorial, Pediatrics **7**: 300-304 (Feb.) 1951.

This committee also recommends the hot air oven as the method of choice for sterilization of needles and syringes. They say: "Inflammations and infections following prophylactic inoculation and other types of injection are not uncommon. Abscesses and severe infections sometimes develop, and may occasionally be fatal. It is usually possible to trace a severe infection due to this cause to some technical fault which might have been avoided by the exercise of sufficient care. Any risk, however small, will produce accidents if it is repeated often enough. . . . Complete bacteriological sterility can be achieved only by sterilization in the autoclave or hot air oven. Boiling in water will destroy all pathogenic bacteria except those that produce resistant spores. . . . 'Sterile,' applied to a syringe and needle, implies that the syringe and needle have been through the process of sterilization in the autoclave or hot air oven. It is often loosely applied to a syringe that has been boiled. . . . Where many injections of the same fluid are given, the same syringe may be used for several consecutive subcutaneous or intramuscular—but not intravenous—injections, provided that a fresh



Syringes and needles used in DTP immunization. *A*, arranged for office use; *B*, in Monel metal containers for mass immunization use, and *C*, 20 gage needle left in vial cap during mass injections to expedite aspiration of 0.5 cc. doses of adjuvant-containing DTP.

needle is used for each patient. . . . Handle needles with sterile forceps only, syringes with dry, washed hands, taking care to touch only the outside of the barrel and the handle of the piston. Do not talk, cough or sneeze over a sterile syringe. Do not allow a sterile needle to touch any unsterilized surface or object before use. . . . Syringes and needles are placed in the oven while it is cold; the time of sterilization is not less than one hour after 160° C has been reached. The oven should be allowed to cool before the syringes and needles are removed. If syringes and needles are sterilized by autoclaving, a temperature of 120° C (15 to 20 lb. pressure) must be maintained for 20 minutes. . . . If an autoclave or hot air oven is not available, 'sterilization' by boiling in water is the method of choice, although boiling cannot be relied on to destroy all spores."

11. Medical Research Council: The Sterilization, Use and Care of Syringes, War Memorandum No. 15, London, His Majesty's Stationery Office, 1945.

12. A few seconds should elapse for its antiseptic action. Early in 1952, following Faber's technique, 2% tincture of iodine was used; later, 1% in 70% alcohol was tried. Profuse lacrimation and frequent desquamation of the skin site made me resume use of 70% denatured ethyl alcohol.

If oven for sterilization or an autoclave is not available, needles and syringes should be boiled for not less than 10 minutes. If assembled when moist, it is conceivable that contamination might occur. Use of sterile forceps decreases this danger, especially when needles are replaced. Should poliomyelitis virus be introduced into a vial when a dose is aspirated and not be destroyed by the preservative before another dose is withdrawn, the virus might be transmitted to susceptible persons.

Sterilizing syringes and needles in an autoclave at 120 C is satisfactory but too time consuming as a routine procedure. It should be reserved for periodic sterilization of small bags of gauze squares and wrapped forceps used in needle exchange.

MASS IMMUNIZATION

Many infants in congested and rural areas are still victims of pertussis and die from its complications. Mass immunization clinics for the administration of slow absorbing DTP should be located at (1) well baby clinics, (2) primary schools, or (3) mobile units. Sessions should be held weekly, semimonthly, or monthly, depending on the number of infants to be injected. Linking pertussis and tetanus with long-established diphtheria immunization saves time for parent, nurse, and physician; it elicits minimal discomfort and hazard to the child. It is now customary to start the primary series at the age of 3 or 4 months, provided the child's health is satisfactory. Soon after an infant's birth, the maternity health nurse should inform the mother when to bring her infant, and the visiting nurse should remind her of the date for the initial dose. A mass immunization team of at least four facilitates antigen administration. When their work is coordinated, about 50 infants can be injected hourly without hazard to any child. The team keeps all records, teaches the mother how to expose the injection site and how she should hold her infant when the dose is administered, gives the card with dates for subsequent doses, and tells her what to do if high fever should occur. The team includes, preferably, a competent nurse who has complete charge of needles, syringes, and the antigen and a registered physician who cleanses each skin site with an individual sterile gauze square (2 by 2 in.), saturated with alcohol [12] before he administers the dose. Routinely, before the sterile syringes and needles are exposed, the nurse and physician wash their hands with soap (preferably under running water), dry on clean individually dispensed towels, and apply 70% alcohol to fingers. As an added precaution, their hands avoid unnecessary contact with any infant. The prone infant on the mother's lap, with only the proper gluteal area exposed is held firmly with her left hand at the knees and the right above the hips to prevent squirming. Each dose is delivered deeply (intramuscularly) and terminated with 0.1 cc. of air. After waiting for a few seconds, the needle is quickly withdrawn and the site gently massaged with the sterile gauze. Alternate lateral gluteal areas, starting with the left proximal are the sites of choice.

The Evanston Health Department established a municipal clinic for smallpox and diphtheria immunization in 1926. Pertussis immunization was added in 1932 and tetanus toxoid in 1944. Infants and preschool children of indigent families and those with low incomes are referred

to the clinic by infant welfare nurses and other agencies. After the parent signs the request slip, the infant is brought to the adjacent room by the mother and the dose is administered. When the series is completed, the parent is given an immunization certificate with the child's name, date of birth, parent's name and address, and date of completion of the injections. A master card is filed in the records of the health department clinic. The only recall dose of slow absorbing DTP (0.5 cc.) is administered before school attendance. During the decade prior to the establishment of the semimonthly immunization clinic (1922-1931) the total of reported cases of pertussis was 3,420 (16 deaths); during the last decade (1943-1952) the total has been 414 reported cases (no deaths). Private patients have been given injections by their physicians. Although the population of the city had increased by about 15%, the number of reported cases has decreased to 12% of that of the preimmunization decade. There has been no death due to diphtheria since 1938, to tetanus since 1940, and to pertussis since 1931.

Failure to confer immunity may be due to the use of impotent vaccine resulting from prolonged or repeated interruption in refrigeration (temperatures above 10 C, or 50 F); outdating; inadequate total basic dosage (when started as early as the 3rd month of life, some infants require four monthly doses of slow absorbing DTP); doses improperly spaced (less than one, or more than three months apart); delay or omission of routine recall or extra recall doses; poor technique (vial not adequately shaken, leaky syringe or needle, or seepage); exposure before immunity was attained; or wrong diagnosis (parapertussis, allergy, or influenza simulating pertussis).

SUMMARY

Diphtheria, tetanus, and pertussis morbidity and mortality warrant early primary mass immunizations with adjuvant containing DTP antigens and precautions against adverse reactions. Prolonged active immunity is attained by three monthly doses starting at 3 months and a recall (stimulating or booster) dose one year later, or four monthly doses starting at 3 months and a recall dose three years later. An extra recall dose (DTP or the specific antigen) should be given promptly after wounding, intimate exposure to diphtheria, or intimate exposure to pertussis. The hot air oven (160 C, or 320 F, for one hour) is the preferred method of sterilization for syringes and needles. Seventy per cent denatured ethyl alcohol on individual pieces of sterile gauze is adequate for sterilizing the vial cap and skin site. Deferment of prophylactic immunization procedures is advised during a poliomyelitis epidemic in the community.

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CONVULSANT EFFECTS OF ISONIAZID

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This report is the first collaborative effort of members of a university department of pharmacology, the staff of a state hospital, and the psychiatric division of another university faculty. Although we have outlined a coordinated research program, we do not assume that the degree of communication necessary for multidisciplinary research has yet been achieved. Data and information are being gathered and consolidated so that the common biological principles involved in our respective disciplines can eventually be more clearly formulated. In the meantime, we are utilizing common observations for emphasizing various perspectives on some similar problems. The pharmacologist is interested in studying the biochemical factors in epilepsy and identifying more effective chemotherapeutic agents for schizophrenic patients.[1] The psychiatrist makes the basic assumption that changes in the internal milieu will be reflected in behavioral alterations. Since the hydrazides alter cerebral cortical functions and produce electroencephalographic evidence of this alteration, this class of biochemical compounds seemed especially deserving of study. This research approach has been described elsewhere.[2] The psychiatrist is interested in the changes in behavior that may be obvious when data are collected prior to, during, and after the administration of hydrazides. Such comparisons may yield further insight into the schizophrenic reactions, the mechanisms by which convulsive experiences modify adaptations in chronic psychotic patients for longer or shorter periods, and the clinical events that signify reversibility or irreversibility of the schizophrenic reactions. This and current collaborative projects may be characterized briefly by stating that we are reciprocally exploiting each other's interests in basic biological and therapeutic problems.

PHARMACOLOGICAL BACKGROUND

The convulsions produced by many unsubstituted hydrazides, given in large amounts by any route, resemble grand mal epilepsy, in that major seizures appear

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Dr. Alfred Paul Bay, Superintendent of Manteno State Hospital, assisted in these studies.

These studies, Proj. M-639, were supported in part by a grant from the United States Public Health Service.

The isoniazid, iproniazid, and pyridoxine used in this study were contributed by Hoffmann-La Roche Inc., Nutley, N. J.

From the Manteno State Hospital (Dr. Tausig), the University of Chicago, Division of Psychiatry (Dr. Apter and Dr. Reilly), and the University of Illinois College of Medicine (Dr. Pfeiffer, Mr. Killam, Dr. Marshall, and Miss Jenney).

1. (*a*) Jenney, E. H., and Lee, L. D.: The Convulsant Effect of Semicarbazide, abstracted, J. Pharmacol. & Exper. Therap. **103**: 349 (Dec.) 1951. (*b*) Stephens, R. R., and others: Grand Mal Convulsive Seizures in Patients Receiving Semicarbazide, abstracted, ibid. **106**: 418-419 (Dec.) 1952.

2. Apter, N. S.; Halstead, W. C.; Eisele, C. W., and McCullough, N. B.: Impaired Cerebral Functions in Chronic Brucellosis, Am. J. Psychiat. **105**: 361-366 (Nov.) 1948. Apter, N. S.; Halstead, W. C., and Heimburger, R. F.: Impaired Cerebral Functions in Essential Hypertension, ibid. **107**: 808-813 (May) 1951. Apter, N. S., and others: Alterations of Cerebral Functions in Pheochromocytoma, Neurology **1**:283-292 (July-Aug.) 1951.

intermittently after a latent period of one to two hours.[1] Other convulsant drugs, administered intravenously, act immediately or, if given orally, produce continuous seizures of the clonic type.

Two known biochemical effects of hydrazides are carbonyl trapping and inactivation of amine oxidases.[3] Moreover, hydrazides lower the cerebral threshold for photic and auditory stimuli. After their administration, flickering light or repeated sounds produce spikes of high potential in the electroencephalogram and myoclonic movements of the extremities. If the stimulation is continued, a grand mal seizure may supervene. Semicarbazide, 40 mg. per kilogram of body weight given intravenously, produces grand mal seizures in man. When photic stimulation is used, the amount of semicarbazide required is reduced to 25 mg. per kilogram.[1b]

TABLE 1.—*Effect of Pretreatment with Semicarbazide on the Susceptibility of Mice to Pentylenetetrazole or Strychnine Toxicity**

Pretreatment Dose of Semicarbazide, Mg. per Kilogram of Body Weight	Lethal Pentylenetetrazole Infusion, Mg. per Kilogram of Body Weight	Lethal Strychnine Infusion, Mg. per Kilogram of Body Weight
0	101	0.79
25	80.3	....
50	41.5	0.80
75	28.0	0.73

* Ten mice were in each group.

The convulsant effects of hydrazides appear slowly but resemble the action of pentylenetetrazole (Metrazol) rather than that of strychnine. This was demonstrated by pretreating mice with subconvulsive doses of semicarbazide and then infusing pentylenetetrazole or strychnine intravenously. The threshold dose of strychnine is constant; however, the amount of pentylenetetrazole diminishes in direct proportion to the size of the pretreatment dose of semicarbazide (table 1). Direct application of semicarbazide to the cerebral cortex of the monkey provided additional evidence regarding the action of the hydrazides.[4] Within 20 minutes spiking appeared at the site of application, the inferior rolandic area. In 30 minutes the spiking spread to temporal and frontal areas. Generalized convulsive movements then ensued. Hydrazide-induced seizures can be controlled by depressant drugs or, in selected instances, by intravenously administered pyridoxine (vitamin B_6).[5] In one case a schizophrenic patient was ordinarily subject to convulsions after taking 4 gm. orally of semicarbazide plus photic stimulation. In this instance, 5 gm. was given orally and five hours later a control electroencephalogram was taken. Thereafter, the RT lead was switched out and all of the leads moved up, so that a recording could be made from the photoelectric cell on the forehead. A variation was seen in the base line of the photoelectric cell lead, owing to myoclonus of the neck muscles. When high potential spikes were obtained in all leads and a seizure was imminent, an intravenous injection of 225 mg. of pyridoxine hydrochloride was given over a 16 second period while photic stimulation was continued. The patient continued to have myoclonus for four to six minutes but did not have a seizure. In this patient spiking occurred earliest and remained latest in the frontal leads.

Isoniazid and iproniazid are inactivators of amine oxidases. Zeller reported that isoniazid is a potent inactivator of diamine oxidase but has little or no inhibiting effect on monamine oxidase. The reverse situation is, however, characteristic of iproniazid activity.[6] Animals given isoniazid die of convulsions with doses of 150 mg. per kilogram of body weight, while iproniazid-treated animals succumb in depression with doses of 750 mg. per kilogram. Therefore, it seems possible that isoniazid would produce convulsions in man but that iproniazid would not unless the isopropyl group was easily removed in the human body. Pyridoxine in the mouse can be used as a partial antidote for both isoniazid and iproniazid (table 2).

A review of the main side-effects of hydrazide therapy in tuberculous patients [7] discloses two types of clinical reactions: those referable to the autonomic nervous system, which are common, and those occurring as a consequence of stimulation of the central nervous system, which are rare (table 3). Convulsions have, however, been encountered. The tuberculous patient with epilepsy requires a higher maintenance dose of an anticonvulsant medicament during isoniazid therapy.

TABLE 2.—*Antidotal Effect of Pyridoxine on Iproniazid and Isoniazid Toxicity in Mice*

Group	Material	Dose, Mg. per Kilogram of Body Weight	No. of Mice		
			Lived	Died	Total
1	Iproniazid intraperitoneally	800	5	23	28
	Iproniazid intraperitoneally and 400 mg. per kilogram of pyridoxine intravenously	800	15	16	31
	$\chi^2 = 4.83$ $p < 0.05$				
2	Isoniazid intravenously	200	1	22	23
	Isoniazid intravenously and 50 mg. per kilogram of pyridoxine intravenously	200	11	12	23
	$\chi^2 = 9.13$ $p < 0.01$				
3	Isoniazid intravenously	200	2	14	16
	Isoniazid intravenously and 100 mg. per kilogram of pyridoxine intravenously	200	11	5	16
	$\chi^2 = 8.29$ $p < 0.01$				

OBSERVATIONS ON PATIENTS

Four types of observations with isoniazid and iproniazid were undertaken in man. These were (*a*) the determination, by electroencephalographic technique, of the degree of sensitization to photic stimulation that isoniazid produces, (*b*) a comparison of isoniazid and iproniazid in a large number of patients to determine the degree of recruitment of facial muscles when patients are exposed to photic stimulation, (*c*) the effect of large doses of each

3. Zeller, E. A., and others: Influence of Isonicotinic Acid Hydrazide (INH) and 1-Isonicotinyl-2-Isopropyl Hydrazine (IIH) on Bacterial and Mammalian Enzymes, Experimentia **8**: 349, 1952.

4. Lowell, D. J.; Ross-Duggan, J. K., and Piazza, S.: The Convulsant Effect of Semicarbazide in Macaca Mulatta, abstracted, J. Pharmacol. & Exper. Therap. **106**: 404-405 (Dec.) 1952.

5. Parks, R. E., Jr.; Kidder, G. W., and Dewey, V. C.: Thiosemicarbazide Toxicity in Mice, Proc. Soc. Exper. Biol. & Med. **79**: 287-289 (Feb.) 1952. Jenney, E. H.; Smith, R. P., and Pfeiffer, C. C.: Pyridoxine as an Antidote to Semicarbazide Seizures, abstracted, Fed. Proc. **12**: 333 (March) 1953.

6. Zeller, E. A., and Barsky, J.: In Vivo Inhibition of Liver and Brain Monoamine Oxidase by 1-Isonicotinyl-2-Isopropyl Hydrazine, Proc. Soc. Exper. Biol. & Med. **81**: 459-461 (Nov.) 1952.

7. Robitzek, E. H., and Selikoff, I. J.: Hydrazine Derivatives of Isonicotinic Acid (Rimifon, Marsilid) in the Treatment of Active Progressive Caseous-Pneumonic Tuberculosis: Preliminary Report, Am. Rev. Tuberc. **65**: 402-428 (April) 1952.

of the drugs on the schizophrenic state, and (*d*) the determination of the convulsant dose of isoniazid in schizophrenic patients. Patients were observed closely before, during, and after the period of drug action. The use of flickering light to induce a seizure effectively reduced the required dose and allowed for the maximal medical assistance at the time of the seizure. During the period of susceptibility to convulsions, patients stayed in bed to prevent possible injury. All of the patients treated with iproniazid were kept on absolute bed rest during the period when postural hypotension developed. Laboratory examinations were performed frequently to detect signs of intoxication as early as possible. The behavioral status of each patient was observed closely to detect, if possible, any changes, minor or major. No concomitant illness existed in any of the chronic schizophrenic patients treated with the drugs.

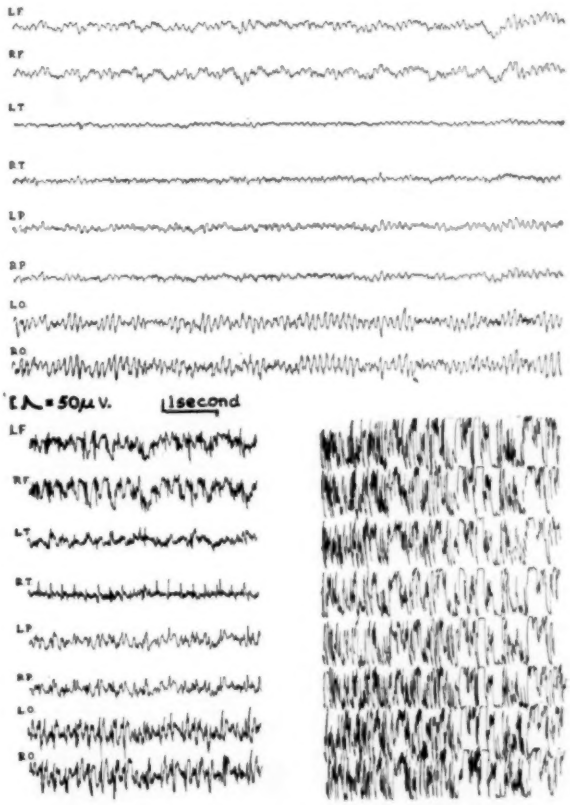
Electroencephalographic Studies.—Isoniazid greatly lowers the epileptogenic threshold for photic stimulation, so that the application of a flickering light (14 to 20 flashes per second) will produce a grand mal seizure. The convulsive response to photic stimulation is first manifested by an initial myoclonic twitching of the

TABLE 3.—*Untoward Effects Encountered in Tuberculous Patients*

	Daily Oral Dose	
Area Affected	Isoniazid, 4 Mg. per Kilogram of Body Weight	Iproniazid, 2 Mg. per Kilogram of Body Weight
Autonomic nervous system (common)	Dryness of mouth Constipation Delayed micturition	Dryness of mouth Constipation Delayed micturition Postural hypotension Syncope
Central nervous system (rare)	Vertigo Muscular twitching Hyper-reflexia Convulsions	Syncope Vertigo and tinnitis Convulsions when given with meperidine Psychosis
Miscellaneous (rare)	Nausea and vomiting	Nausea and vomiting Anemia Icterus

orbicularis oculi and supra palpebral muscles. This is followed by recruitment of the frontalis and jaw muscles and then generalized myoclonus, which terminates in tonic extension and loss of consciousness. The succession of movements resembles the pattern described by Gastaut, who used photic stimulation immediately after the intravenous administration of pentylenetetrazole, 7 mg. per kilogram of body weight.[8] The electroencephalogram at first shows an augmented alpha potential in the occipital leads and then spiking activity in the frontal leads. The figure shows the reaction of schizophrenic patient who was given 20 mg. per kilogram of isoniazid intramuscularly. Two hours later photic stimulation was started and continued for four minutes, after which a grand mal seizure occurred. The selected records are at one minute, two minutes, and four minutes. At one minute, the patient showed high alpha waves in the occipital leads. At two minutes, high potential spikes occurred in all leads but were more numerous in the occipital and frontal leads. The last record shows the grand mal seizure. By way of contrast, the electroencephalogram, after large intramuscular doses of iproniazid (25 to 40 mg. per kilogram), records no abnormalities over a period of three to four hours, nor do these large doses lower the threshold for photic stimulation. Large single doses of iproniazid are well tolerated. Signs of intoxication are, however, produced by daily doses of 15 mg. per kilogram.

Recruitment After Photic Stimulation.—The phenomenon of recruitment of the facial muscles may be used to assay a lowered threshold for photic stimulation. In 31 patients of both sexes an oral dose of 15 mg. per kilogram of isoniazid induced recruitment to photic stimulation in 14 of the 31 patients two to four hours after the drug was given. When tested at the same time after an oral dose of iproniazid (15 mg. per kilogram), none of the 31 patients showed this recruitment. We, therefore, concluded that a hydrazide must be unsubstituted to produce convulsions.



Electroencephalogram of patient who received photic stimulation two hours after administration of isoniazid, 20 mg. per kilogram of body weight. A grand mal seizure occurred.

Use of Moderately Large Doses of Isoniazid and Iproniazid.—Isoniazid and iproniazid, in combination with photic stimulation, were administered to two groups of patients. Group 1 consisted of eight chronic schizophrenic patients with predominantly catatonic features and was designated for long-term therapeutic trial with moderately large doses. Patients of group 2, similarly composed, were observed to determine the convulsant dose of isoniazid. For both groups the drugs were given three times per week on alternate days. During a three month preliminary observation period there were no substantial changes in behavioral patterns. Group 1 was then submitted to two separate therapeutic trials. During the first trial, half of group 1 received isoniazid and half

8. Gastaut, H.: Combined Photic and Metrazol Activation of the Brain, Electroencephalog. & Clin. Neurophysiol. 2: 249-261 (Aug.) 1950.

received iproniazid. The dosage was 15 mg. per kilogram of body weight for each drug. This was considered a subconvulsive dose. The drug was injected intramuscularly, and, about two hours later, the patients were photically stimulated (14 to 20 flashes per second) for five minutes. Blood pressure and pulse readings were taken frequently on treatment days (table 4). Iproniazid, after 9 to 10 treatments over a three week period, produced postural hypotension in all four patients and was, therefore, discontinued. The hemoglobin decreased to 60% of normal in one patient. After a two week rest period, all of the eight patients in group 1 were given isoniazid for the second trial. The patients who had been taking iproniazid received 15 mg. per kilogram of isoniazid. Those who had been taking isoniazid in the first trial had an increase in dosage to 25 mg. per kilogram intramuscularly (table 4). These large single intramuscular doses of isoniazid were without toxic effect and consistently produced a convulsion in only one patient. This seizure occurred with photic stimulation.

TABLE 4.—*Effect of Repeated High Dosage of Iproniazid and Isoniazid in Group One*

		Trial 1						
Name	Sex	Drug, 15 Mg. per Kilogram of Body Weight 3 Times per Week	No. of Treatment Days	Periorbital Myoclonus	Head Jerks	General Myoclonus	Convulsions	
A. H.	F	Iproniazid	9	0	0	..	0	Drug discontinued after seventh to ninth treatment owing to severe postural hypotension, with syncope that lasted 10 days
T. N.	M	Iproniazid	7	1	0	..	0	
J. P.	M	Iproniazid	9	0	0	..	0	
J. W.	M	Iproniazid	9	0	0	..	0	
A. H.	F	Isoniazid	10	8	1	..	0	No ill-effects
M. M.	F	Isoniazid	10	5	2	..	0	No ill-effects
R. B.	M	Isoniazid	10	4	0	..	0	No ill-effects
T. G.	M	Isoniazid	10	3	0	..	0	No ill-effects
		Trial 2, All Patients Were Given Isoniazid Intramuscularly 3 Times per Week						
Name	Sex	Dose, Mg. per Kilogram of Body Weight						
A. H.	..	15	11	11	0	0	0	No ill-effects
T. N.	..	15	11	1	0	0	0	No ill-effects
J. P.	..	15	11	2	1	0	0	No ill-effects
J. W.	..	15	11	11	1	0	0	No ill-effects
A. H.	..	25	10	10	9	8	8	Tachycardia (140) developed 1½ hours after injection. This lasted several hours. Electrocardiogram showed tachycardia and no other abnormality
M. M.	..	25	11	5	1	0	0	No ill-effects
R. B.	..	25	11	10	2	1	0	No ill-effects
T. G.	..	25	11	11	11	4	0	No ill-effects

TABLE 5.—*Summary of Sixty-Two Clinical Trials of Isoniazid as a Convulsant Agent in Group Two**

		Dosage, Milligrams per Kilogram of Body Weight Intramuscularly						
Patient	Sex	20	22	25	30	35	40	45
P. McF.	F	O (3) PS (1)	....	....	....	....	....	....
M. L.	M	PS (1)	.....	PS (1)	.....	.....	.....	.....
A. K.	M	.....	.....	O (1)	PS (2)	O (1)	.....	.....
S. L.	F	O (1)	PS (3)	PS (1)	PS (1)	.....	.....	.....
		.....	.....	.....	T (1)	.....	T (1)	.....
C. B.	F	.....	.....	O (1)	O (1)	O (2)	O (1)	.....
		.....	.....	.....	.....	PS (2)	PS (1)†	.....
R. M.	F	.....	.....	O (1)	O (1)	PS (2)	.....	.....
		.....	.....	.....	.....	O (1)	.....	.....
		.....	.....	.....	.....	T (2)	T (2)	.....
B. B.	M	.....	.....	O (1)	O (1)	PS (2)	.....	.....
		.....	.....	.....	.....	O (2)	O (1)	.....
		.....	.....	.....	.....	S (1)	S (1)	.....
H. K.	M	.....	.....	O (1)	O (1)	O (3)	O (1)	.....
		.....	.....	.....	.....	PS (1)	PS (2)	.....
L. K.	M	.....	.....	O (1)	O (1)	O (1)	O (1)	O (1)
		.....	.....	.....	.....	PS (2)	.....	.....
		.....	.....	.....	.....	T (1)	T (1)	.....

* Photic stimulation was 14 to 24 flashes per second applied hourly. O indicates no seizure occurred in spite of photic stimulation. PS indicates a seizure was induced by photic stimulation. T indicates that tachycardia with a pulse rate of over 130 per minute occurred. S indicates that a spontaneous seizure occurred. The figures in parentheses show the number of trials with the same designated dose in which the same result was obtained.
† Seizure accompanied by apnea of moderate duration.

Determination of the Convulsant Dose of Isoniazid.—The nine patients in group 2 were given steadily increasing intramuscular doses of isoniazid in increments of 5 mg. per kilogram, to determine the dosage at which convulsions could be induced with photic stimulation. This group was composed of nine chronic schizophrenic patients of various subtypes. The dosage schedule was arranged so that one male patient, L. K., was given 5 mg.

per kilogram more than the other five patients on all treatment days until a convulsive dose of isoniazid was ascertained (table 5).

In doses ranging from 20 to 45 mg. per kilogram given intramuscularly, 30 out of 62 trials resulted in no seizure and 22 resulted in a lowered threshold for photic stimulation, so that a generalized convulsion occurred. Eight trials produced tachycardia above 130 beats per minute; in these cases photic stimulation was not attempted and pyridoxine was given as an antidote. Spontaneous seizures occurred twice in one patient (B. B.) after doses of 35 and 40 mg. per kilogram, respectively. The only suggestion of a serious reaction was moderately prolonged apnea in one woman after a photic-stimulation-induced seizure. Doses as large as 40 mg. per kilogram were not reliably convulsant, since we have 4 failures at this dosage and 10 failures at 35 mg. per kilogram. Although these doses were given three times a week with a one day rest period in between, we had the impression that these patients were showing some degree of tolerance to the convulsive dose rather than an increase in sensitivity. All of the patients showed some degree of improvement in their mental state, but the improvement was not dramatic and was quite comparable to the degree of improvement that might be expected from equivalent electroconvulsive therapy.

COMMENT

In addition to a general intolerance to autonomic agents, possibly explained by an inhibitory effect on amine oxidases, the isoniazid-treated patient may have a central nervous system that is sensitized to auditory and visual stimuli. Thus, patients on high dosages of isoniazid should be warned and protected from flickering lights and repetitive noises. All patients should be carefully questioned regarding epilepsy, seizures, or convulsions in childhood when isoniazid therapy is contemplated. Since isoniazid is excreted in the urine, poor kidney function may also cause excessive intoxication.

If convulsions occur, 100 to 120 mg. of phenobarbital should be given slowly intravenously. Dienemann [9] reports that in a 50-year-old male tuberculous patient who was taking 6 mg. per kilogram of body weight of isoniazid daily, convulsive seizures developed 10 to 15 minutes after an injection of Irgapyrin (combination of phenylbutazone and aminopyrine). Phenobarbital (dose?) was given intramuscularly, and shortly thereafter respiration stopped. Analeptics and artificial respiration were ineffective. Thereafter, Simon [9] showed in the mouse that the convulsive effect of aminopyrine is enhanced by pretreatment with isoniazid. The possible convulsion enhancing effect of phenylbutazone (Butazolidin) was not studied.

Pyridoxine is completely effective in preventing grand mal convulsions in man and animals when simple hydrazides such as the semicarbazides are the convulsant agents.[10] This antagonism of pyridoxine against isoniazid can also be demonstrated reliably in animals; however, the antagonism is not complete, and, therefore, sodium phenobarbital should be the anticonvulsant of choice if convulsions occur in patients. With the usual doses of isoniazid, the patient who has convulsions probably has unsuspected epilepsy. Therefore, the greatest benefit might be obtained with depressant anticonvulsant medication such as phenobarbital rather than pyridoxine. Diphenylhydantoin is ineffective in the experimental animal and, therefore, is not indicated in these convulsions, nor should it be relied on to protect the epileptic tuberculous patient when isoniazid therapy is used. In the tuberculous patient, the use of pyridoxine as an antidote to isoniazid toxicity may temporarily negate the chemotherapeutic effect if these new agents inhibit the bacterial enzyme systems in which pyridoxine is involved; however, 200 to 400 mg. of pyridoxine can be given intravenously if continuous convulsions are uncontrolled by phenobarbital.

Isoniazid has been well tolerated intramuscularly by schizophrenic patients in single doses as high as 40 mg. per kilogram. These high doses should reassure phthisiologists of the safety of this new drug. This knowledge may be useful to those who give single high doses of either isoniazid or iproniazid to prevent bronchial infection at the time of the operation. The patients used in this study had normal kidney function and no epileptic tendencies—two facts that must be known before giving large single doses; however, the present dose of 4 mg. per kilogram a day of isoniazid has been determined to be moderately safe in all patients, and, therefore, the nonepileptic patient with good kidney function could probably tolerate safely 10 to 12 mg. per kilogram a day in divided doses and higher doses if phenobarbital is given concomitantly. These high doses should be chemotherapeutically more effective in the treatment of tuberculosis.

SUMMARY

Hydrazides lower the threshold for photic stimulation in both animals and man. Isoniazid alone or combined with photic stimulation may result in a grand mal seizure when large single intramuscular doses are given. The effective convulsant dosage of isoniazid varies with the person. The extremes in this study were from 22 mg. to 35 mg. per kilogram of body weight. Isoniazid caused spontaneous seizures in one patient with intramuscular doses of 35 and 40 mg. per kilogram. No dosage level of isoniazid up to 45 mg. per kilogram would consistently produce convulsions. A tachycardia of 130 or more occurred in a significant number of patients on high doses. These findings make isoniazid undesirable as a convulsant agent for shock therapy. Iproniazid in a dosage of 15 mg. per kilogram three times a week produced severe postural hypotension within three weeks in all patients, whereas single large doses were well tolerated. Iproniazid does not lower the threshold for photic stimulation and is, therefore, probably not directly convulsant in man. The slight change in mental status of some of the schizophrenic patients during hydrazide therapy was not remarkable.

1853 W. Polk St. (12) (Dr. Pfeiffer).

9. Dienemann, G., and Simon, K.: Report of a Death with Combined Administration of Irgapyrin and Neoteben (INH), München med. Wchnschr. **95**: 221-222 (Feb. 13) 1953.

10. Reilly, R. W., and others: Therapy of Resistant Schizophrenia with Semicarbazide and Photic Stimulation, abstracted, Fed. Proc. **12**: 359-360 (March) 1953.

DIABETES IN A NEW ENGLAND TOWN

REPORT OF FOUR YEAR PROGRESS STUDY OF THE OXFORD, MASS., DIABETES SURVEY OF 1946-1947

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The state of 70 diabetics after a lapse of time and the challenge of the premise "once a diabetic, always a diabetic" prompted a return to the town of Oxford, Mass., to study those persons previously identified as having diabetes in a community survey there. The results of the original survey had been interpreted, by some authorities, to mean that there were over one million unknown cases in this country. Of equal interest was a study of the behavior of incipient diabetes, or the so-called prediabetic state. In the winter of 1946-1947, a diabetes survey was made of 70.6% of the entire population of 4,983 persons in Oxford, Mass. The objective was to determine the prevalence of diabetes in an American community and to study methods for screening large groups for diabetes.[1] On the fourth anniversary of the Oxford survey, a progress study was begun in order to determine the status of the diabetics originally discovered and to investigate the interim development of diabetes in selected groups. It was thought this study would provide valuable information about the natural history and epidemiology of diabetes.

Certain facts about the original report should be recalled: 1. Postprandial blood and urine tests for sugar were done on all participants. 2. The age distribution of the population in Oxford, Mass., closely paralleled that of the United States in 1945. 3. Forty persons in the town were previously known to have diabetes, and 30 new cases were found. 4. Two per cent of the group tested had diabetes. 5. The most conservative estimate of prevalence for the town was 1.4%, based on 0.8% known and 0.6% previously unknown cases. This estimate assumed that no diabetes existed among the untested population. 6. If the number of unidentified cases among untested persons on the basis of the rate for persons tested is estimated and added, the prevalence of diabetes in Oxford becomes 1.7%.

The prevalence rate of 1.4 to 1.7% indicated in the original paper has been substantiated in several other surveys. From San Jose, Calif.,[2] a diabetes prevalence of about 1.6% in an industrial population was reported. In one of the most comprehensive studies to date, Kenny, Chute, and Best [3] did blood and urine tests on 81% of the 4,800 population of Newmarket, Ontario, Canada, and reported a prevalence of 1.2%. In general, the studies utilizing a combination of personal interview, history, and laboratory tests have proved that the earlier studies based on questionnaires have been far too conservative in their estimates of diabetes prevalence.[4]

The follow-up study in Oxford, Mass., was conducted in the winter of 1950-1951. The following groups from the original survey were included in the study, with a view to determining their present diabetic status: (1) the 30 cases of previously unknown diabetes that were discovered in the first survey, (2) the 40 cases of diabetes that were already known to physicians at the time of the first survey, (3) a blood sugar suspect group of 118 persons with borderline or relatively higher than normal blood sugar readings in the first survey, (4) a control group of 225 persons with average or normal blood sugar readings in the first survey, conforming in age and sex distribution to the blood sugar suspect group, and (5) a glycosuria suspect group of 17 persons repeatedly showing sugar in the urine with variable blood sugar levels that did not meet the criteria for the diagnosis of diabetes.

TABLE 1.—*Status of Seventy Diabetics from the Oxford, Mass., Survey on Follow-Up, 1950-1951*

Status on Follow-Up, 1950-1951	Total	Newly Discovered, 1946-1947	Known Prior to 1946-1947
Total	70	30	40
Living, diabetic	47	20	27
Living, diabetes questioned	7	2	5
Dead, diabetic	15	7	8
Dead, diabetes questioned	1	1	..

METHODS

For the diabetics studied, a short interim history was recorded, including information on changes relative to general health and diabetes. Venous blood specimens were taken one to two hours after a meal containing at least 50 gm. of carbohydrate. Blood sugar analyses were done by the standard Folin-Wu method, as they had been in the 1946-1947 survey.[5] The presence of urinary sugar was detected by the suitable diagnostic procedures (Clinitest and Galatest). In addition, when the diagnosis of diabetes was in question, a three hour 100 gm. oral glucose tolerance test was done. Limited follow-up studies had been done on the diabetic patients in 1948,

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Frank K. Butler, public health adviser, and Barbara Glenn, statistician, United States Public Health Service, assisted in the collection, compilation, and analysis of data in this report.

1. Wilkerson, H. L. C., and Krall, L. P.: Diabetes in New England Town: Study of 3,516 Persons in Oxford, Mass., J. A. M. A. **135**: 209 (Sept. 27) 1947.

2. Canelo, C. K.; Bissell, D. M.; Abrams, H. K., and Breslow, L.: Multiphasic Screening Survey in San Jose, California Med. **71**: 409 (Dec.) 1949.

3. Kenny, A. J.; Chute, A. L., and Best, C. H.: Study of Prevalence of Diabetes in Ontario Community, Canad. M. A. J. **65**: 233 (Sept.) 1951.

4. The Magnitude of the Chronic Disease Problem in the United States: National Health Survey, 1935-1936, Bulletin 6, Sickness and Medical Care Series, U. S. Public Health Service, 1938. Marks, H. H.: Statistics of Diabetes, New England J. Med. **235**: 289 (Aug. 29) 1946.

5. Because of the increasing trend to true blood sugar determinations, as championed by Mosenthal and Barry (Criteria for and Interpretation of Normal Glucose Tolerance Tests, Ann. Int. Med. **33**:1175 [Nov.] 1950), Haunz and Keranen (Clinical Interpretation of Blood Sugar Values: Study of Folin-Wu, Somogyi-Nelson and Wilkerson-Heftmann Blood Sugar Determinations in 100 Subjects, Proc. Am. Diabetes A. **10**: 200, 1950), and others, the Somogyi-Nelson blood sugar determination was also done on each blood specimen in order to confirm the Folin-Wu procedure. A comparison of different blood sugar methods is the subject of another paper.

and occasional reference will be made to these data where meaningful.

One of the newly discovered, or unknown, cases and five of the previously diagnosed, or known, cases had moved from the town, and the status of each of these six was determined by visit or correspondence. For the blood sugar suspect group, the control group, and the glycosuria suspect group, the same type of interim history was recorded and the same procedure of postprandial tests was done if possible, though occasionally blood sugar determinations were made with capillary instead of venous blood, according to the Folin-Malmros method. To establish the possibility of diabetes, if any patient in these groups had a postprandial venous blood sugar reading between 140 and 200 mg. per 100 cc. in the progress study, a standard three hour 100 gm. oral glucose tolerance test was done where possible.

For the sake of consistency in comparing results, the diagnostic standards of the original study were used—over 170 mg. per 100 cc. on venous blood (Folin-Wu) or over 200 mg. per 100 cc. on capillary blood (Folin-Malmros), confirmed by the analysis of a second specimen. In one case postprandial blood was not obtained and a confirmed fasting Folin-Wu test of over 130 mg. per 100 cc. was accepted as diagnostic. In the original study all patients with questionable or borderline cases had been given a standard oral glucose tolerance test, in which attention had been paid primarily to the height of the curve. In the current follow-up, however, attention was paid to both the height and duration of the curve. Occasionally a diagnosis was considered justifiable on the basis of a single very high postprandial blood sugar test when confirmed by the analysis of a second postprandial specimen.[6]

COURSE OF THE DISEASE IN THIRTY PREVIOUSLY UNKNOWN AND FORTY KNOWN DIABETICS

In the four year progress study the first problem was to determine the validity of the original classification of patients (table 1). Forty-seven of the total of 70 persons classified as diabetics in 1946-1947 were living in 1950-1951 and showed evidence of diabetes. Another seven now living would have questionable diagnoses on the basis of current laboratory data, if the past evidence of diabetes were not available. Therefore, they are designated in table 1 as diabetes questioned. Sixteen of the 70 have died, 15 of whom were considered diabetic and 1 of whom had hyperglycemia and glycosuria that might possibly have been related to gastrectomy one year prior to the 1946 survey, history of which was obtained subsequently. Deserving of special comment are the eight cases in which the original classification of diabetes may

TABLE 2.—*Course of Disease in Thirty Diabetics Discovered in 1946-1947 Survey*

Case No.	Sex	Age in 1950 or at Death	Blood Sugar* in Mg. per 100 Cc. 1946	Blood Sugar* in Mg. per 100 Cc. 1950	Glycosuria, 1950	Control, 1950 Diet	Control, 1950 Insulin	Serious Illness Reported	Cause of Death	Disposition
1	M	20	190+	113	3+	Yes	0	None	.....	Glycosuria, diabetes questioned
2	F	61	496	306	2+	Yes	Yes	None	.....	Diabetes
3	M	73	180	191	1+	Yes	0	Kidney disease	.....	Diabetes
4	F	43	180	176 T	1+	Yes	0	None	.....	Diabetes
5	F	56	200	231	4+	0	0	Heart attacks	.....	Diabetes
6	M	58	190	178	0	Yes	0	None	.....	Diabetes
7	M	53	215	...	...	....	....	→	Coronary heart disease	Diabetes questioned
8	M	80	340	...	...	....	....	→	Cancer, kidney disease, uremia	Diabetes
9	M	57	200 T at 2 hr.		...	....	....	→	Cancer	Diabetes
10	F	51	270	205 T	0	Yes	0	None	.....	Diabetes
11	F	52	260	510 (1948)	4+	0	0	Vision failing	.....	Diabetes
12	M	57	243	123	1+	Yes	0	None	.....	Glycosuria, diabetes questioned
13	F	59	350 C	260	4+	Yes	0	None	.....	Diabetes
14	M	86	229 at 1 hr.		...	....	....	→	Cerebrovascular accident, arteriosclerotic heart disease	Diabetes
15	F	66	229 at 3 hr.		...	....	....	→	Myocardial insufficiency, chronic cystitis, diabetes	Diabetes
16	M	81	190 at 2 hr.		...	....	....	→	Arteriosclerosis, coronary heart disease	Diabetes confirmed in 1948
17	M	54	195	241 T	3+	Yes	0	None	.....	Diabetes
18	F	59	200	194	2+	Yes	0	None	.....	Diabetes
19	M	60	190	...	...	Yes	0	None	.....	Physician confirmed diabetes
20	M	58	190	205	0	0	0	Arthritis, varicose veins	.....	Diabetes
21	F	61	175	146 F	2+	Yes	0	None	.....	Confirmed in 1948, diabetes
22	F	97	290 CT	...	1+	0	0	Complications of old age	.....	Confirmed in 1948, diabetes
23	M	74	251	...	...	....	....	→	Cause of death unknown, moved	Diabetes
24	M	46	235	211	4+	0	0	None	.....	Diabetes
25	M	59	295	286	3+	Yes	0	None	.....	Diabetes
26	F	55	270	...	...	....	....	None	.....	Diabetes; moved
27	F	86	200	...	...	....	....	→	Arteriosclerotic heart disease, blind at death	Diabetes
28	F	73	340 C	300	3+	Yes	Yes	None	.....	Diabetes
29	F	43	243	222	3+	Yes	0	None	.....	Diabetes
30	F	40	180	283	4+	Yes	0	None	.....	Diabetes

* Unless otherwise stated, highest postprandial blood sugar readings are shown, determined by venous Folin-Wu method: C = capillary blood, determined by Folin-Malmros; T = highest reading on glucose tolerance test, unless otherwise stated; and F = fasting blood sugar.

6. Diabetes Guide Book for the Physicians, New York, American Diabetes Association, Inc., 1950.

now be questioned (three newly discovered and five previously known; seven living and one dead).

In most of the group of 30 who were newly diagnosed in 1946-1947 on the basis of laboratory findings and His one hour venous blood sugar tolerance peak had been 190 mg. per 100 cc., with a drop to 128 after two hours. In 1948, he had a similar glucose tolerance curve with glycosuria, but in 1950-1951 he had a normal curve

TABLE 3.—*Course of Disease in Forty Diabetics Known Prior to 1946-1947 Survey*

Case No.	Sex	Age in 1950 or at Death	Blood Sugar * in Mg. per 100 Cc.		Glycosuria, 1950	Control, 1950		Serious Illness Reported	Cause of Death	Disposition
			1946	1950		Diet	Insulin, Units			
31	F	32	260	...	...	Yes	30 NPH †	Unknown	.....	Diabetes, (patient and physician confirmed diagnosis)
32	F	44	235	318	4+	Yes	16 PZI ‡ 5R §	None	.....	Diabetes
33	M	73	180	194	4+	Yes	16 PZI	Carcinoma, colostomy	.....	Diabetes
34	M	82	170	305	3+	Yes	40 PZI	None	.....	Diabetes
35	F	75	220	305	4+	Yes	0	Arthritis	.....	Diabetes
36	M	57	200	140	3+	Yes	40 PZI 15R	Coma, amputation of foot (gangrene)	.....	Diabetes
37	M	36	132	87 (1948)	0	Yes	0	None	.....	Diabetes, questioned by laboratory data
38	F	61	208	...	...	....	.....	.....	Cancer, diabetes	Diabetes
39	F	56	170	274	4+	Yes	14 PZI	Gallbladder disease	.....	Diabetes
40	F	73	157	143	0	0	0	None	.....	Diabetes, questioned hyperthyroidism
41	F	81	253	320 C (1948)	4+	Yes	0	Tuberculosis	.....	Diabetes
42	F	62	260	...	...	....	.....	.....	Moved, cause of death unknown	Diabetes, confirmed in 1948
43	M	53	170 C	141	0	0	0	.....	.....	Diabetes, questioned by laboratory data
44	M	49	...	322	4+	Yes	20 PZI	None	.....	Diabetes
45	F	69	132 at 2 hr.	...	....	.....	.....	.....	Cancer, nephrosclerosis	Diabetes, confirmed by physician
46	F	57	350 C	247	1+	Yes	0	Vision failing	.....	Diabetes
47	M	54	94	...	...	Yes	0	None	.....	Diabetes, moved, given insulin in 1946
48	F	64	300	...	...	....	.....	.....	Diabetic acidosis, nephrosclerosis, arteriosclerotic heart disease	Diabetes
49	F	63	285	...	...	....	.....	.....	Chronic nephritis, diabetes, uremia, arteriosclerosis	Diabetes
50	F	49	248	305	4+	Yes	15 PZI	Heart attack	.....	Diabetes
51	F	46	125	162	2+	Yes	0	None	.....	Diabetes
52	M	72	158	...	...	....	.....	.....	Cancer	Diabetes
53	F	71	115	140	0	0	0	.....	.....	Diabetes, questioned by laboratory data
54	F	62	315	183 (1948)	...	Yes	86 PZI 4R	Amputation of toe (gangrene)	.....	Diabetes
55	F	52	290	355	4+	Yes	0	Impaired vision	.....	Diabetes
56	M	79	170	451	4+	Yes	0	None	.....	Diabetes
57	M	78	200	...	...	....	.....	.....	Coronary thrombosis	Diabetes
58	M	78	243 at 3 hr.		...	....	.....	.....	Coronary thrombosis	Diabetes
59	F	75	270	224	4+	Yes	28 PZI 20R	Coronary heart disease	.....	Diabetes
60	F	56	110 C	109	0	Yes	0	.....	.....	Diabetes, questioned by laboratory data
61	M	73	243	146	0	Yes	20 PZI	None	.....	Diabetes
62	F	64	105 C	146	0	Yes	0	Cerebrovascular hemiplegia	.....	Diabetes, confirmed by physician
63	M	42	248	170	0	Yes	25 PZI 5R	Blind (duration of diabetes mellitus, 28 yr.)	.....	Diabetes
64	F	71	135 C	343	4+	Yes	0	Impaired vision, neuritis	.....	Diabetes
65	F	55	280	188 (1948)	...	Yes	10 PZI (1948)	.....	.....	Diabetes, moved, confirmed in 1948
66	F	63	208	382	3+	?	20 PZI	Kidney disease, cataract	.....	Diabetes
67	M	44	94	286	4+	0	36 PZI	None	.....	Diabetes
68	F	48	No tests in survey laboratory						.....	Diabetes, moved, confirmed by physician
69	F	73	110	143	0	Yes	10 PZI	None	.....	Diabetes
70	F	23	270 (1948)	309	4+	Yes	34 PZI 15R	2 spontaneous abortions	.....	Diabetes

* Highest postprandial blood sugar readings are shown, determined by venous Folin-Wu method. Those noted as C are capillary, determined by Folin-Malmros.
† NPH = modified protamine insulin.
‡ PZI = protamine zinc insulin.
§ R = regular insulin.

confirmation by their attending physicians (table 2), the classification of diabetes has been borne out in the progress study. For a summary of three exceptions, see cases 1, 7, and 12. In the original survey, the patient in case 1 had been considered to have borderline or very early diabetes, which should have been followed. with glycosuria. He has never been overweight and did not develop any signs of frank diabetes in four years. His paternal grandmother died of diabetes. In case 7, the response to the original glucose tolerance studies in 1946 had been a one hour blood sugar peak of 260 mg. per 100 cc. plus glycosuria, with a decrease to 150 mg. per

100 cc. in two hours, and a drop to 74 mg. per 100 cc. in three hours. Subsequent inquiries disclosed that some time prior to the original test, the patient had had a subtotal gastrectomy. These findings suggest the possibility of a "dumping syndrome," as described by Custer, Butt, and Waugh [7] and others. This patient died of coronary heart disease in 1948 at 53 years of age. In spite of the possibility that rapid intestinal absorption accounted for the diabetes picture, we believe he had a mild case of diabetes. In case 12, 20 lb. (9.1 kg.) of weight were lost in the four year interval. On the basis of laboratory tests alone, a classification of diabetes was not justified in 1948 or in 1950. Weight reduction, particularly in a person with mild diabetes, can result in the disappearance of symptoms and signs of the disease.

For each of the 40 cases in which diabetes had been diagnosed prior to 1946 (table 3), an attempt was made to confirm the patient's history of diabetes with his physician. In 5 of these 40 cases (37, 40, 43, 53, and 60) neither laboratory data in 1946-1947 nor progress data in 1950-1951 confirmed the original classification of diabetes, which had been made on the basis of medical history and confirmation of family physician. In three of the five cases, the original reported history of diabetes was of considerable duration, varying from 10 to 20 years.

It is interesting to note that the follow-up study revealed, through the search of death certificates, that at least three other diabetics, heretofore unknown to the investigators, had been under treatment in Oxford at the time of the original survey. These were clear-cut cases of diabetes, in which the patients had been given insulin and had diabetes listed on their death records. One other known diabetic came to our attention only recently, when he had a leg amputated. These four persons had not been listed as known diabetics in the original survey.

On the basis of the follow-up study in Oxford, on the whole, the original classification of diabetics seems justified. In the eight cases cited, the diagnosis of diabetes may currently be questioned on the basis of laboratory tests; however, we agree with a group of medical consultants who emphasize that at one time these eight have been diagnosed as diabetic by their family physicians and those now living might well be mild diabetics in remission.

DEATHS AMONG DIABETICS

Of the 70 diabetics listed in the original survey in 1946-1947, at least 62 were still considered to be diabetics in 1950-1951 (table 1). In the four year interval, 15 of this group had died, leaving 47 of the original group alive. Seven of the 15 deaths occurred among the diabetics newly discovered in 1946-1947, and 8 among the group discovered previously. According to age at time of death, mortality had occurred as follows: Of the 15 persons from age 55 to 64, 5 had died; of 11 aged 65 to 74, 4 had died; of 11 attaining age 75 or over, 6 had died. An estimated annual death rate for the group aged 55 to 74 would be 86.5 deaths per 1,000 per year, which is considerably higher than the general mortality experience for the state of Massachusetts, which was 29.7 for that age group. The average age at death for the total group of diabetics was 72: 76 for the group discovered in the original survey, and 68 for those previously known.

As to the cause of death, two died at about age 64 with diabetes and kidney disease, one of them in diabetic acidosis. Five deaths were due to cancer and two with associated kidney disease. Three deaths were attributed to coronary heart disease and two to other forms of heart disease. One death was due to cerebrovascular accident. Two deaths occurred outside the area, and the cause has not been obtained. Diabetes was listed on only 4 of the 13 death certificates available for study. Some form of arteriosclerosis was named on six certificates.

CHARACTERISTICS OF GROUP LIVING WITH DIABETES DURING FOUR YEAR PERIOD

It was possible to study the 47 diabetics classified in the 1946-1947 survey who were living in or near Oxford in 1950-1951. As can be seen from table 4, 27 of the group, or about 57%, were aged 45 to 64 years. Several factors were recorded on the interim history or under laboratory data in order to indicate in some degree the control maintained. A history was taken of any serious illnesses or complications of diabetes, such as acidosis, gangrene, blindness, cataract, glomerulosclerosis, or gallbladder disease. Physical examinations were not done, and this limited the completeness of the data. Details of the findings for individual cases are presented in tables 2 and 3.

TABLE 4.—*Age Distribution in 1950 of Forty-Seven Diabetics from Original Survey*

Age Group	Total	Discovered During Survey	Known Prior to Survey
Total	47	20	27
20 to 44	8	3	5
45 to 64	27	14	13
65 to 74	6	2	4
75 and over	6	1	5

Methods of Control.—Information was obtained from the 20 living patients who had been newly discovered in 1946-1947 as to whether they were under treatment with insulin and/or diet. Five of the group reported no attempt at control by either diet or insulin. In all of these the laboratory results indicated blood sugar above 200 mg. per 100 cc. Glycosuria was present in all but one. Twelve reported some limited adherence to diet without insulin, although the diet history was not obtainable in detail. Only two of the group were given insulin therapy along with diet therapy. Reliable information could not be obtained from one person, but it was thought that no effort was being made to maintain control. Among the 27 old cases remaining from the group diagnosed prior to 1946, some degree of control was reported by more patients than in the newly discovered group. All, in fact, reported some type of control. Nine reported dietary control only; 2 reported they were given insulin without any particular dietary control; and 14 had both diet and insulin. In two cases reliable information was not available.

Glycosuria and Blood Sugar Results.—Glycosuria was a common finding among the diabetics in the progress study. Thirty-three out of the 40 tested (or 83%) had

7. Custer, M. D., Jr.; Butt, H. R., and Waugh, J. M.: So-Called "Dumping Syndrome" After Subtotal Gastrectomy: Clinical Study, Ann. Surg. **123**: 410 (March) 1946.

some degree of glycosuria. Glycosuria was equally common among both the previously discovered and the newly discovered group. If it had been practical to collect 24 hour urine specimens, it is thought that glycosuria would have been present in every case. There were available for study 35 comparable postprandial blood sugar determinations for 1946-1947 and 1950-1951 in the group of 47 diabetics studied. There was interest in the level of blood sugar maintained and any significant changes since the original survey. The correlation of 1950-1951 blood sugar levels to those of the original study is shown in table 5. In 1946-1947, 9 had blood sugar readings above 250 mg. per 100 cc.; in 1950-1951, 16 had blood sugar readings this high. Since 1946, 13 of the diabetics studied have shown a marked increase in blood sugar readings, 14 have the same range of blood sugar, and 8 have shown a decrease. Those showing marked increases in blood sugar readings were almost all among the previously known group, and the newly discovered group have generally the same blood sugar distribution as in the original study.

Serious Illness.—A history was recorded regarding serious illness and hospitalization occurring between the original survey and the follow-up period. Only five, 25%, of the 20 in the newly discovered group reported serious illness in the interim period. These include one case each reporting kidney disease, heart disease, failing vision, arthritis, and debility of old age. From the data collected, the relation of these conditions to diabetes cannot be postulated. It is significant that 15, 75%, of these newly discovered patients, reported no serious illness. The history of serious illness was much commoner among the 27 in the previously known group. Fourteen, or about 52%, of them reported some type of serious illness. Two reported amputations due to gangrene; one was blind as a result of diabetes of 28 years' duration; three others reported failing vision, and one a diabetic cataract as well as kidney disease. One young woman with moderately severe diabetes under treatment with both insulin and diet reported two spontaneous abortions. Other illnesses reported are listed in table 3. Only 10, or about 37%, of the diabetics in the previously known group reported no serious illness. In three cases, or 11%, the history of illness was incomplete.

TABLE 5.—*Venous Folin-Wu Postprandial Blood Sugar Readings of Thirty-Five Diabetics*

	Blood Sugar in Mg. per 100 Cc., 1946-1947	Blood Sugar in Mg. per 100 Cc., 1950-1951				
		Below 170	170 to 199	200 to 249	250 to 299	300 and Over
Total	35	6	6	7	5	11
Below 170	5	3	..	..	1	1
170-199	10	1	5	..	2	2
200-249	11	2	1	4	..	4
250-299	6	..	..	2	1	3
300 and above....	3	..	..	1	1	1

The information on these cases is not complete enough to evaluate precisely their physical condition and to relate these findings to the degree of control of their diabetes; however, a general description of the health problem created by diabetes in a small community can be drawn from the study. The diabetics are chiefly a middle-age group, with some in the older age brackets. Their life expectancy is less than that of the average person. Judging from laboratory findings, glycosuria is quite common and about half of the diabetics have markedly elevated blood sugar readings, indicating a lack of control. The commonest method of control was diet, with more than one-third of the patients being given insulin too. Many of these patients, particularly those with diabetes of long duration, have serious illnesses, some of which are undoubtedly related to diabetes. This is acknowledged to be only a part of the picture of diabetes morbidity and its sequelae as they affect the community.

BLOOD SUGAR SUSPECT GROUP AND CONTROL GROUP

In the original survey the screening level, i.e., the level above which blood sugar readings were considered suspicious of diabetes, was 160 mg. per 100 cc. by venous Folin-Wu method, or 190 mg. per 100 cc. by capillary Folin-Malmros method. About 3% of the total number of persons examined from one to one and one-half hours postprandially fell above this point. If we go a little lower down the blood sugar scale to 140 mg. per 100 cc. with venous or 170 mg. per 100 cc. with capillary blood, about 8% of the group will be screened out. In this borderline group with blood sugar above 140 mg. in venous or 170 mg. in capillary blood per 100 cc., but not satisfying the diagnostic criteria, we suspected that more diabetics would have developed in the four year interim period than among those with lower blood sugar levels. The answer to this problem might give some clue to the prediabetic state, or at least indicate a group that should be reexamined periodically. In this report this group is arbitrarily called the blood sugar suspect group. In addition to the persons classified as diabetics in the original survey, therefore, the persons who had had borderline or relatively higher than normal blood sugar levels in 1946-1947, but who were not diagnosed as diabetic, were studied.

There were 161 persons who had had blood sugar readings above 140 mg. per 100 cc. by venous Folin-Wu or above 170 mg. per 100 cc. by capillary Folin-Malmros, but had not met the diagnostic criteria of the survey. About a third of these had been reexamined in 1946-1947, as they had had readings above the screening level but had been considered nondiabetic by subsequent tests. Of the original 161 persons, 43 were inaccessible in 1950-1951, 18 having died and most of the remainder having moved away. The remaining 118 were examined by means of blood and urine sugar tests. The routine procedure has been described under methods.

As a control group with which to compare the blood sugar suspect group, a sample of 294 was selected from the 3,277 persons in the original survey with venous blood sugar readings below 140 mg. per 100 cc. or capillary blood sugar readings below 170 mg. per 100 cc. This sample was selected so as to conform with the age and sex distribution of the suspect group. In the follow-up, we were able to test 225 of these for diabetes, since 24 had died and the remainder had moved or were not available. The age distribution of the two groups is quite close, although not exactly matched after the loss of persons who died or moved. The control group has 8% more persons 45 to 54 years of age and 4% fewer persons 35 to 44 years old. These differences render the

conclusions conservative, since it is generally conceded that diabetes becomes more recognizable in persons over 45. Both the blood sugar suspect group and the control group have an equal distribution of men and women.

In the blood sugar suspect group as well as in the control group, about 83% of those selected to be studied were given laboratory tests. As a result of testing 118 persons with relatively high blood sugar readings, 17 diabetics were discovered, or 14.4%. In the control group of 225 persons, 4 diabetics were found, or 1.8% (table 6). The difference between the percentage of

TABLE 6.—*Results of Diabetes Examinations, by Age, in a Blood Sugar Suspect Group and a Control Group**

	Suspect Group			Control Group		
	No. of Persons	Diabetics		No. of Persons	Diabetics	
Age in 1950	Examined	No.	%	Examined	No.	%
All ages	118	17	14.4	225	4	1.8
Under 35	35	..	....	65	..	...
35-44	20	3	15.0	29	..	...
45-54	18	5	27.8	52	..	...
55-64	23	5	21.7	39	3	7.7
65 and over	22	4	18.2	40	1	2.5

* The suspect group includes persons who had in the original survey blood sugar readings above 140 mg. per 100 cc. venous or 170 mg. per 100 cc. capillary. In the control group the readings in original survey were below these values.

diabetics in the blood sugar suspect group and the percentage of diabetics in the control group is significant, since this difference might occur by chance alone less than once in 1,000 times.

Particularly notable were three young persons, two men and one woman, aged 35, 36, and 35, respectively, who had had readings around 140 mg. per 100 cc. in 1946-1947 and who were now diabetics. The percentage of diabetics among persons over age 35 was 20.5 in the suspect group, as contrasted with 2.5 in the control group. The proportions of diabetics were higher in the suspect group than in the control group for both men and women.

Several different blood sugar levels from the 1946-1947 survey were studied in relation to later development of diabetes. Of the 161 with suspicious blood sugar results, about 80% had had levels in the first test in 1946-1947 below the diagnostic level (170 mg. per 100 cc. Folin-Wu or 200 mg. per 100 cc. Folin-Malmros). The remainder had shown hyperglycemia above these diagnostic levels that was not demonstrated again on tests repeated within a few days after the first test. Of the original 161 cases with suspicious blood sugar results, 36 had had capillary blood analysis. On follow-up of 25 of these, none proved to be diabetic; however, 72% of these were children under 20 years of age in whom diabetes is relatively uncommon. Of 125 persons with original suspicious venous determinations, 88 were successfully followed. When these persons are grouped on the basis of their original blood sugar readings (in 1946-1947), the following comparison can be made:

1946-1947 Venous Blood Sugar Reading (Mg. per 100 Cc.)	No. Examined	Diabetics in 1950-1951	
		No.	%
140-170	75	13	17.3
170-200	13	4	30.8
Total	88	17	19.3

It can be seen that the larger number of those studied (75) and most diabetics found (13) occurred in those persons in the suspect group who at no time reached the diagnostic level of 170 mg. per 100 cc. The percentage becoming diabetic was higher, as might be expected, among those few persons with definite hyperglycemia (170 to 200 mg. per 100 cc.) on first test alone, which was not confirmed on recheck. These findings in the suspect group are consistent with a recent statement of Lukens [8] that he has become suspicious of any blood sugar value above 140 after meals, although a single report at such a level does not warrant the diagnosis of diabetes.

GLYCOSURIA STUDY GROUP

In the original report [1] the following statement was made: "Tentatively 17 subjects were considered as having unclassified glycosuria, because of persisting glycosuria in the absence of hyperglycemia. It is believed that 7 of these persons may become diabetic because of widely fluctuating blood sugar levels." At that time these cases were not thought to fit the so-called renal glycosuria classification because their laboratory findings were too variable. In the follow-up study of the group with unclassified glycosuria, four persons were found to be diabetic (three of these had been among the suspicious seven in 1946-1947). Six continued to show glycosuria without accompanying hyperglycemia, five showed no laboratory signs of diabetes, and two died. In the original survey, 9 of the 17 with persistent glycosuria had blood sugar readings above 140 mg. per 100 cc. venous and were therefore included with the blood sugar suspect group. Of these nine persons, three had become diabetic in 1950 and two continued to show glycosuria. Of the 17 with persistent glycosuria, 8 had had blood sugar readings below 140 mg. per 100 cc. on original survey. One of these persons had become diabetic in 1950, while four continued to show glycosuria.

CRITERIA OF DIAGNOSIS IN FOLLOW-UP STUDY

As has been noted, in order to obtain comparable results the criteria used in the follow-up study were the same as those used in the original survey. However, glucose tolerance tests (table 7) for 13 of the 22 diabetics discovered since 1946-1947 have been carefully studied in relation to current criteria for diabetes. According to the criteria of the American Diabetes Association,[6] diabetes is present when the blood sugar is above the following levels (venous Folin-Wu): 200 mg. per 100 cc. after eating and 130 fasting. They emphasize that the fasting blood sugar may be normal in early diabetes.

In the series of 13, all except 4 patients had above 200 mg. per 100 cc. blood sugar levels at one hour. Of the four exceptions three had about 190 mg. per 100 cc. at that point and one had 174 mg. per 100 cc.; however, at the fasting reading, the majority of the diabetics, 9 out of 13, had readings well below 130 mg. per 100 cc. At the three hour reading, 5 of the 13 were below 130 mg. per 100 cc.

The elevated two hour reading on glucose tolerance test has been considered by many observers as the key

8. Lukens, F. D. W.: Proper Use of Laboratory Tests in Diagnosis and Management of Diabetes, Diabetes **1**: 13 (Jan.-Feb.) 1952.

figure in diagnosis of diabetes. Recently Moyer [9] has recommended 150 mg. per 100 cc. at two hours as indicative of diabetes, and this criterion appears reasonable. All of the diabetics in this series were above 150 mg. per 100 cc. at two hours with one exception, who was only slightly below. All of the persons classified as diabetic demonstrated glycosuria repeatedly, the one exception being a woman of 80 years. Comparison of the glucose tolerance findings in this series with criteria recommended by the American Diabetes Association and other authorities shows close agreement. The classification of diabetes in these cases, it is believed, would be generally accepted.

end in itself. It is effective only when combined with follow-up, patient education, and attainment of adequate treatment through the earnest teamwork of the physician and his patient. "From the preventive aspect, of primary importance . . . is the actual determination of whether or not early treatment will lead to a lessening of the severity of the disease, increased ease of control, and facilitate the prevention of complications." [10]

There is a need to determine a widely acceptable clinical definition of diabetes control. More definitive study is necessary to determine the prognosis in relation to the various degrees of such control. We recognize the great importance of attempting to relate the control of diabetes

TABLE 7.—*Pertinent Data and Laboratory Findings for Twenty-Two Diabetics Discovered in Progress Study*

				Progress Study									
						Glucose Tolerance Test							
						Blood Sugar				Urine Sugar			
Case No.	Sex	Age in 1950	First Survey Post-prandial Blood Sugar	Post-prandial Blood Sugar	Post-prandial Urine Sugar	Fasting	1 Hr.	2 Hr.	3 Hr.	Fasting	1 Hr.	2 Hr.	3 Hr.
Blood Sugar Suspect Group													
71	M	35	140	146	Trace	92	217	150	90	0	4+	3+	Trace
72	F	35	145	194	+	129	254	254	186	Trace	2+	3+	3+
73 *	M	49	154	148	Normal	...	...	...	...	.....	.....	.....	.....
74	M	68	170	169	Trace	105	234	198	137	0	1+	2+	1+
75 *	M	58	162	...	.....	...	...	...	...	.....	.....	.....	.....
76	F	49	142	333	4+	...	...	...	...	.....	.....	.....	.....
77 *	M	48	170	192	2+	...	...	...	...	.....	.....	.....	.....
78	F	80	142	166	Normal	107	194	169	143	0	0	0	0
79	M	68	154	166	3+	111	191	169	104	1+	3+	4+	4+
80	F	54	150	250	3+	169	314	348	309	0	3+	4+	1+
81	M	77	162	174	Normal	119	283	171	113	0	Trace	4+	2+
82 *	F	58	170	152	Normal	...	...	...	...	.....	.....	.....	.....
83	F	53	145	186	Normal	133	248	301	191	0	3+	4+	4+
84	M	56	180	307	4+	...	...	...	...	.....	.....	.....	.....
85	M	57	154	176	Normal	121	283	231	150	3+	4+	4+	4+
86	M	36	142	154	Trace	100	189	146	121	0	Trace	Trace	0
87	M	62	165	211	2+	113	296	211	137	1+	4+	4+	3+
Glycosuria Suspect Group													
75 (See above group)													
77 (See above group)													
79 (See above group)													
88	M	48	135	258	4+	...	...	...	...	.....	.....	.....	.....
Control Group													
89	F	72	128	495	4+	...	...	...	...	.....	.....	.....	.....
90	M	56	125	141	3+	91	174	178	169	Trace	3+	4+	3+
91	M	61	75	150	4+	137	234	159	86	0	2+	4+	3+
92 *	M	55	132	222	3+	...	...	...	...	.....	.....	.....	.....

* Diagnosed by private physician between 1946 and 1950. In all cases starred, except 77, insulin was given. All blood sugar determinations are venous Folin-Wu.

COMMENT

Of concern and importance in the detection, diagnosis, and management of diabetes are those patients who have been shunted aside or not thoroughly followed because they have "a little sugar in the urine" or blood sugar "a little higher than normal." Our findings tend to indicate that these are the future diabetics. Whatever preventive measures are available to the medical armamentarium could be best focused on these cases of near diabetes. It should be emphasized that case finding can never be an

in the individual person and in the community to the control of either mortality or the development of complications, but we also realize that the amount and scope of our data are inadequate up to this time. Our current efforts in diabetes epidemiological studies are directed, therefore, toward the procuring of sufficient data to bridge some of the gaps in our knowledge of detection and control factors in diabetes.

SUMMARY

A four year diabetes follow-up study was made in Oxford, Mass., in 1950-1951 of the following groups selected from those persons tested for diabetes in the original 1946-1947 survey: 70 diabetics identified in 1946-1947; a blood sugar suspect group of 118 with

9. Moyer, J. H., and Womack, C.: Glucose Tolerance: II. Evaluation of Glucose Tolerance in Liver Disease and Comparison of Relative Value of 3 Types of Tolerance Tests, Am. J. M. Sc. **216**: 446 (Oct.) 1948.

10. Commission on Chronic Illness, Proceedings of the Conference on the Preventive Aspects of Chronic Disease, March 12-14, 1951, Raleigh, N. C., Health Publications Institute, Inc., 1952, p. 216.

borderline or relatively higher than normal blood sugar readings in the original survey; a control group of 225 with average or normal blood sugar readings in the original survey; and a suspect group of 17 with repeated glycosuria. The purposes of the study were to investigate the diabetic status and general health of the diabetics seen in the original survey, verify the cases of diabetes first observed, and investigate the incidence of diabetes in the interim period among a suspect group selected on the basis of relatively high blood sugar readings.

The method of the study was to obtain postprandial blood and urine sugar analyses, and glucose tolerance tests when necessary. Also an interim history of diabetes and general health was recorded. In 62 of the 70 diabetics observed in the original survey, the classification of diabetes was justified on follow-up. In seven of the other eight cases currently failing to meet criteria for diabetes, there exists the possibility of remission of mild diabetes, but they are subject to question. In one patient, now dead, we believe mild diabetes was present, but the possibility exists of a "dumping syndrome." There were found to be at least four known diabetics living in Oxford at the time of the original survey who had not been listed in the first study. Of the original group of 70 diabetics, 16 have died. The death rate for the age group 55 to 74 years is higher than general mortality experience for that group.

For the 47 in the original group of diabetics who were still living, a study was made of the method of control of diabetes, glycosuria and blood sugar results, and serious illness or diabetic complications. These findings emphasize the original conclusion that there is a need in the community for improved control in the diabetics. The blood sugar suspect group studied was comprised of 118 persons with blood sugar readings in the original survey above 140 mg. per 100 cc. (venous) or 170 (capillary); the control group was made up of 225 persons with original blood sugar readings below these values. In the blood sugar suspect group, 17 diabetics were discovered, or 14.4%; in the control group, 4 diabetics were discovered, or 1.8%. The high incidence of diabetes in the blood sugar suspect group suggests that persons with relatively high but not diagnostic blood sugar levels should be periodically followed. The findings indicate that it is likelier that diabetes develops in such persons than in persons with average or normal blood sugars. Among a group of 17 persons with unclassified glycosuria in the original survey, 4 have become diabetic in the four year interval. (Of these diabetics, three were included also in the blood sugar suspect group.) This suggests that the allegedly harmless glycosurias may often hide incipient diabetes.

At the time of the four year follow-up study, 69 living diabetics in Oxford were known to the investigators. The general picture is that most of those who had diabetes still have the disease, which has progressed since the 1947 study. Some of the severest degenerative sequelae appeared to be present in the patients with the poorest degree of control, although this is not definitely proved at this time. More detailed follow-up studies continue on all groups described.

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CLINICAL NOTES

ACUTE PSYCHOSIS AS A COMPLICATION OF HYDRALAZINE THERAPY IN ESSENTIAL HYPERTENSION

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Considerable publicity has recently been given to the newer hypotensive agents. The most promising of these drugs, hexamethonium, a ganglionic blocking agent, and hydralazine (Apresoline) hydrochloride, a sympathetic blocking agent with other complex actions, are now being used extensively in treatment of patients with essential hypertension.[1] A third compound, Dibenzyline (N-phenoxyisopropyl-N-benzyl-β-chloroethylamine) hydrochloride is an orally effective, sympathetic blocking agent that produces a fall in blood pressure when the patient is in an upright position, and is capable of preventing wide fluctuations in pressure as well as relieving symptoms.[2] All of these drugs may produce severe reactions if they are not used under controlled conditions. Grimson and his associates [3] and Schroeder [4] have recently published reports advising caution in the use of these drugs.

We have encountered numerous side-reactions of these three drugs, used either alone or in combination, in a group of carefully selected patients being treated for essential hypertension. Dibenzyline produced severe fatigue, marked persistent tachycardia, postural hypotension, persistent stuffy nose, and aspermia in several patients. In some patients hexamethonium administered orally or parenterally resulted in severe postural hypotension and syncope, difficult urination, constipation, and persistent blurring of vision. Marked tachycardia, headaches, vague muscle and joint pains, aspermia, nausea, and periorbital edema were experienced by

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The hexamethonium used in this study was supplied by E. R. Squibb Co., New York; the Dibenzyline by Smith, Kline and French Laboratories, Philadelphia; the hydralazine (Apresoline) by Ciba Pharmaceutical Co., Summit, N. J.; and hexamethonium chloride (Methium) by the Chilcott Laboratories, Morris Plains, N. J.

1. Schroeder, H. A.: Effect of 1-Hydrazinophthalazine in Hypertension, Circulation **5**: 28-37 (Jan.) 1952. Freis, E. D.; Finnerty, F. A., Jr.; Schnaper, H. W., and Johnson, R. L.: Treatment of Hypertension with Hexamethonium, ibid. **5**: 20-27 (Jan.) 1952. Schroeder, H. A.: Control of Hypertension by Hexamethonium and 1-Hydrazinophthalazine: Preliminary Observations, A. M. A. Arch. Int. Med. **89**: 523-540 (April) 1952. Campbell, A. J. M.; Graham, J. G., and Maxwell, R. D. H.: Treatment of Hypertension by Oral Methonium Compounds, Brit. M. J. **1**: 251-261 (Feb. 2) 1952.

2. Moser, M.; Walters, M.; Master, A. M.; Taymor, R. C., and Metraux, J.: Chemical Blockade of the Sympathetic Nervous System in Essential Hypertension, A. M. A. Arch. Int. Med. **89**: 708-723 (May) 1952.

3. Grimson, K. S.; Orgain, E. S.; Rowe, C. R., Jr., and Sieber, H. A.: Caution with Regard to Use of Hexamethonium and "Apresoline," J. A. M. A. **149**: 215-220 (May 17) 1952.

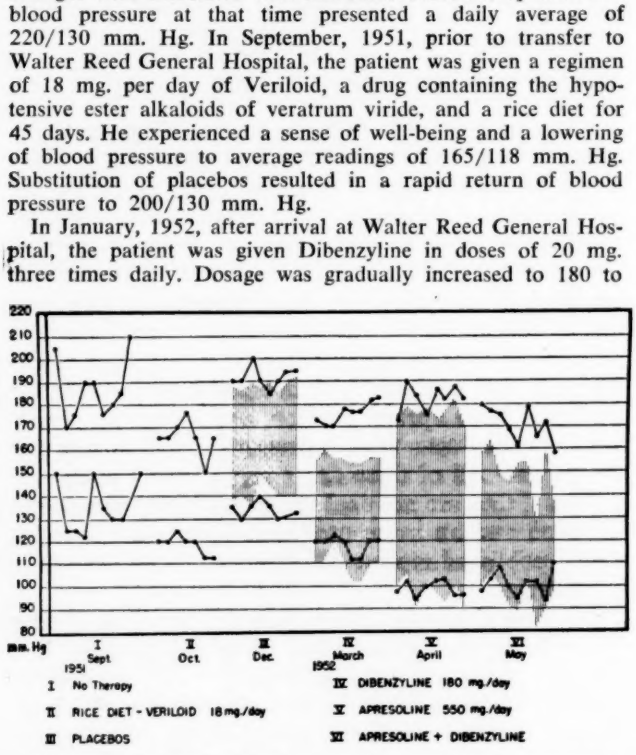
4. Schroeder, H. A.: New Antihypertension Drugs, correspondence, J. A. M. A. **149**: 297 (May 17) 1952.

patients receiving hydralazine therapy. In addition, two patients receiving hydralazine noted episodes of transient euphoria, three experienced attacks of nervousness, and one, the subject of this case report, experienced a severe psychotic episode.

REPORT OF A CASE

A 44-year-old white man had hypertension of 28 years' duration. He had enjoyed good health until June, 1951, when he suffered a thrombosis of a branch of the left middle cerebral artery, with right hemiparesis, facial weakness, and spastic aphasia. There was a gradual clearing of the facial weakness and speech difficulty. No intellectual or unusual emotional changes were associated with this cerebrovascular episode. His blood pressure at that time presented a daily average of 220/130 mm. Hg. In September, 1951, prior to transfer to Walter Reed General Hospital, the patient was given a regimen of 18 mg. per day of Veriloid, a drug containing the hypotensive ester alkaloids of veratrum viride, and a rice diet for 45 days. He experienced a sense of well-being and a lowering of blood pressure to average readings of 165/118 mm. Hg. Substitution of placebos resulted in a rapid return of blood pressure to 200/130 mm. Hg.

In January, 1952, after arrival at Walter Reed General Hospital, the patient was given Dibenzyline in doses of 20 mg. three times daily. Dosage was gradually increased to 180 to



Response of the blood pressure to therapy. Each section represents a 7 to 10 day period after the blood pressure had been stabilized by a particular drug. Each point represents an average of four to six readings per day. Shaded areas represent blood pressure with the patient in an upright position. (Psychotic episode occurred during April.)

200 mg. per day. Initial side-reactions of nasal congestion, palpitations, and lightheadedness in the upright position partially cleared in 7 to 10 days. A fall in blood pressure to a daily average of 176/116 mm. Hg in the recumbent position and 154/108 mm. Hg in the upright position was obtained, with occasional low readings of 130/80 mm. Hg. During this period there were no episodes suggestive of mental deterioration or emotional instability.

Initial blood cell counts and urinalyses were normal and remained so throughout the patient's hospitalization. Studies of renal function revealed no abnormalities on admission or when repeated weekly. Funduscopic examinations and photographs revealed arteriolar spasm and narrowing with several small hemorrhages, a grade 3 retinopathy. Weekly examinations revealed some clearing of the hemorrhages and disappearance of arteriolar spasm with continuation of treatment. Chest roentgenograms showed moderate left ventricular hypertrophy, and repeated electrocardiograms showed a persistent abnormality indicating left ventricular hypertrophy with myocardial ischemia.

After approximately one and one-half months of Dibenzyline therapy, there was partial tolerance of the drug, with a gradual increase in recumbent blood pressure levels to 190/120 mm. Hg. Postural changes persisted.

On March 30, therapy with hydralazine, 25 mg. four times daily, was begun. The daily dose was progressively increased to 550 mg. per day, with the blood pressure and clinical response as a guide. The patient complained of a slight headache, which disappeared by the fifth day. When the daily dose reached a total of 350 mg. on the seventh day of therapy, there was a definite, improved sense of well-being characterized by increased mental alertness, cheerfulness, desire to return to work, and feelings of extreme confidence and resourcefulness. Whereas the patient had previously been reserved and uncommunicative with ward personnel, he became friendly. At this time blood pressure averaged 170/95 mm. Hg, with no significant postural changes. No alteration in blood chemistry or renal function was noted. The patient was discharged from the hospital, and his wife was taught how to measure blood pressure and to vary the dosage of hydralazine accordingly.

On the 10th day of hydralazine therapy, the patient experienced a sudden mood of depression with an outburst of intense crying. He felt dejected and gloomy but could offer no explanation for his feelings. An interview on his return to the hospital produced no evidence that this was a reaction to an adequate external cause or to internal difficulties. Cessation of the depressive mood was immediately followed by a feeling of cheerfulness and happiness. A sense of well-being developed, with gradual evolution into a mild degree of maniacal excitement. The patient experienced fantasies of tremendous physical and mental potential. These feelings and mood swings continued on the 11th day of therapy, but were not as marked.

On the 12th day of treatment, the patient, who was on a dosage schedule of 550 mg. of hydralazine per day, inadvertently took 200 mg. before breakfast, instead of the usual 100 mg. Within an hour he was in a delusional state characterized by fantasies of intellectual genius and unlimited ability to solve problems and prognosticate world affairs. He also had fantasies of making tremendous profits through clever business manipulations. The patient had auditory hallucinations in which he heard his own voice talking and planning "from within his head." He felt that he was receiving "divine guidance" for his exploits. Judgment was profoundly impaired. He approached strangers and offered advice. He rejected all appeals to reason by his wife and grew angry and irritable when she attempted to correct his delusional impressions. Violent episodes of anger alternated with periods of intense crying. The patient later recalled that his thoughts flowed at such a tremendous pace that he was unable to keep up with all of them. Blood pressure readings at this time were 160/95 mm. Hg when the patient was in a recumbent position and 150/90 mm. Hg in the upright position.

Hydralazine administration was discontinued, and, within 8 to 12 hours, there was marked remission of symptoms and a return of the personality toward normal. Within 24 hours the patient was psychiatrically asymptomatic and completely rational. For the next month he was maintained on a combination of small doses of hydralazine, 100 to 150 mg. per day, and Dibenzyline, 80 to 120 mg. per day, with a satisfactory blood pressure effect, and remained free of any untoward emotional side-reactions. Medication was then changed to a combination of 2 gm. of hexamethonium chloride (Methium) administered orally and 200 mg. of hydralazine, because of the development of a partial tolerance of the Dibenzyline and hydralazine combination. The patient received the new medication for two months with a satisfactory blood pressure response. He appeared to be well adjusted except for occasional periods of depression.

About three months after his initial psychotic episode the patient experienced a complete breakdown. This followed a sudden feeling of inadequacy in performing routine assignments at his job. He became severely depressed and suicidal and was admitted to the psychiatric service for treatment. The patient remained depressed for several months and made little progress until he was given doses of insulin producing subcoma. His feelings of inadequacy extended to include relationships with his family and friends as well as his career activities. All drug therapy was stopped after the episode of depression, and recent blood pressure levels have averaged between 190/120 and 240/140 mm. Hg. During the entire period of observation

the patient's urinary output was normal, and repeated renal function studies did not reveal any abnormalities. Neurological examinations were essentially normal.

COMMENT

A relationship between the first psychotic episode in this patient and a specific drug has been shown. The patient showed evidence of basic personality changes while receiving daily dosages of 350 mg. of hydralazine. Psychotic manifestations were noted when the total daily dose was increased to 550 mg. After the patient took a single large dose of 200 mg. of hydralazine by mistake an acute psychotic episode, characterized by manic type behavior, occurred. With cessation of the drug there was marked improvement in 12 hours and complete reversion to normal in 24 hours. This patient had been maintained with several other medicaments during four months of hospitalization and was not particularly sensitive to drugs. He had periods of acute hypotension while receiving Dibenzyline and for a brief period while he was being tested with parenterally administered hexamethonium, but he had not experienced emotional outbursts or aberrations. During the acute psychosis with hydralazine treatment, blood pressure was not unusually low. We felt, therefore, that the episode was not secondary to marked alterations in cerebral blood flow. Renal function and blood chemistry remained within normal limits. The psychotic episode apparently represented a manifestation of hydralazine overdosage. Since the progression of the personality changes was carefully observed and the relationship of drug administration to the psychosis was well established clinically, we did not feel that the occurrence was coincidental or that it was necessary to reproduce the severe symptoms by readministration of large doses of hydralazine.

Several months later the patient had a severe depressive reaction that required a prolonged psychiatric hospitalization. This reaction did not appear to be related to drug effect and was not altered by the withdrawal of all medication. It seemed to be closely related to serious unresolved personality problems, which may have been aggravated by the patient's continuing hypertensive cardiovascular disease; that is, his feelings of inadequacy may have been directly related to his illness and lack of ability to cope with problems that formerly would have been quite simple.

It is logical to assume that the initial psychotic episode might not have occurred in a stable person, despite an overdose of a potent drug that apparently has a "central" action. (We have observed another patient who inadvertently took 600 mg. of hydralazine in a single dose and experienced no unusual psychiatric manifestations.) The previous adjustment of our patient was a tenuous one because of unresolved personal problems, and he was, therefore, susceptible to a break with reality in stressful situations. Similarities between his psychiatric symptoms and those described as following withdrawal of cortisone and corticotropin are striking and consist of hallucinations, delusions, extreme variations in mood, ideational flight, and depressive states.[5] Apparently some potent pharmacological agents are capable of altering physiological mechanisms in areas of psychogenic responses and may embarrass or decompensate an already precarious stability. These agents should be used with care, and the physician should be constantly aware of the possibility of precipitating a "breakdown of defenses" with a resulting psychotic episode.

The occurrence of acute anxiety episodes in patients with poor renal function and uremia, and who were receiving hydralazine, has been noted by Schroeder.[4] These personality alterations usually did not occur or were transient in patients without renal disease. In our case, euphoria continued for a longer period than is expected in such conditions, and an episode of mania was produced by a large dose of hydralazine. It is possible that the patient's mental state would have gradually returned to normal, even though he was maintained on 500 to 550 mg. per day, if he had not taken the extra dose of the drug. The psychological manifestations noted in this patient during hydralazine therapy, as well as the euphoria that occurred in other patients with this therapy, may provide additional evidence that the drug affects the higher cerebral centers.

SUMMARY

A case of acute psychosis as a result of hydralazine (Apresoline) overdosage in a patient with essential hypertension is reported. This episode apparently was not related to change in blood pressure or to renal function. Clinical recovery followed in 12 to 24 hours after withdrawal of the drug. This episode may have resulted from a release of basic personality conflicts after the disease state had been altered by the drug. The subsequent severe prolonged depression that was unrelated to hydralazine therapy substantiates this explanation.

Although hydralazine is a useful agent for treatment of essential hypertension, its administration, especially in outpatients and in unstable persons, should be carefully controlled. It is suggested that administration of this drug, as well as other agents used in the treatment of hypertension, be discontinued or the dose reduced if personality changes occur.

5. Rome, H. P., and Braceland, F. J.: The Psychological Response to ACTH, Cortisone, Hydrocortisone, and Related Steroid Substances, Am. J. Psychiat. **108**: 641-651 (Feb.) 1952.

James Lind and the Treatment of Scurvy.—On completion of his medical apprenticeship in 1739, Lind entered the British navy as a surgeon's mate. . . . Up to Lind's time a number of books and papers had been written about scurvy, and in fact many had suggested the use of fruit juices for the prevention and treatment of the disease. It is to Lind's credit, and an example of his honesty and integrity, that in all of his writing he appreciated this fact and gave due recognition to the earlier observations. . . . In 1747, Lind carried out his experiment which proved conclusively that orange or lemon juice was a specific treatment for scurvy. . . . Not only did Lind demonstrate in a controlled experiment the importance of citrus juices in the treatment of scurvy, but his practical and inventive mind led him to develop an improved method for the preservation of citrus juice, a significant development in food technology. . . . Despite the excellence of Lind's results, his official position in the Royal Navy, and his detailed report in the "Treatise on the Scurvy" published in 1753, it was not until almost 50 years later (1795) that the Admiralty finally gave orders for the compulsory issue of lemon juice to all ships. This "perversity of officialism" and gross governmental inefficiency undoubtedly resulted in a loss of life from scurvy during this period greater than that from all other causes of seamen's deaths put together.—W. A. Krehl, James Lind, M.D. (October 6, 1716—July 18, 1794), *Journal of Nutrition*, May, 1953.

TELEPAQUE AND PSEUDOALBUMINURIA

E. E. Seedorf, M.D.
W. N. Powell, M.D.
R. G. Greenlee, M.D.
and
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Since the occurrence of pseudoalbuminuria after ingestion of iodoalphionic acid (Priodax) [1] and Monophen (2-[4-hydroxy-3,5-diiodobenzyl]-cyclohexane carboxylic acid) [2] was reported, another cholecystographic medium, Telepaque (3-[3-amino-2,4,6-triiodophenyl]-2-ethyl-propanoic acid), has been employed successfully. Telepaque is a solid containing 66.68% iodine, while iodoalphionic acid contains 51.5% and Monophen 52.2% iodine. Experiments with animals at the Sterling-Winthrop Research Institute have shown that Telepaque, taken orally, is eliminated mainly by the gastrointestinal tract but to some extent by the kidneys.

As a fairly high incidence of pseudoalbuminuria was found after ingestion of iodoalphionic acid and Monophen,[2] study of Telepaque was undertaken to determine whether the small amount of this drug eliminated through the urinary tract was sufficient to cause pseudoalbuminuria. Chemical examination of the substance showed that it readily dissolved in water. When the solution was acidified, a flocculent precipitate appeared, and, when it was alkalized, the precipitate disappeared.

Over 100 patients received Telepaque, but only the first 100 (40 men and 60 women) to meet all the requirements were accepted for this study. Reasons for rejection were: the presence of albumin in the routine urinalysis before the medium was ingested; urine specimen not presented for examination before ingestion of the medium, the day after ingestion (day of gallbladder examination), and the day after the gallbladder examination; and menstruation.

The manner of administering Telepaque to the patients was similar to that used for the other cholecystographic mediums. Telepaque was given in four tablets, a total dosage of 2 gm. It had been established that this amount produced cholecystograms of as great or greater density than six tablets of iodoalphionic acid or six capsules of Monophen. As in the previous studies on iodoalphionic acid and Monophen, Exton's reagent, Heller's ring test, Robert's reagent, and nitric acid and heat were used to examine urine for the presence of albumin.

Table 1 shows the number and/or percentage of false positive reactions for albuminuria when hot Exton's reagent was used. This is the most significant portion of the table, as the Exton's test is the one most universally employed for the detection of albuminuria. Of the 100 patients, whose preliminary urinalyses showed no evidence of albumin, 15% had positive Exton's tests (pseudoalbuminuria) after the ingestion of Telepaque. This compares closely with the 14% incidence found with iodoalphionic acid and the 17% with Monophen in our earlier study.[2] Although the urine and Exton's reagent mixture should be observed while hot, it is interesting to note that when the result is read after the solution has cooled the incidence of positive results increases considerably.

A preliminary urinalysis negative for albumin with hot Exton's solution was obtained on all patients before any gallbladder medium was given; however, preliminary urinalyses with the other albumin-testing reagents were not obtained before the medium was given. In order to correctly evaluate these reagents we ran a control group of 100 urinalyses. The control patients received no gallbladder medium and their urine specimens were negative to the routine Exton's test. When the Exton's reagent was cool, a false positive result was observed in nine specimens. All were negative to Heller's test. The nitric acid and heat test gave a positive reaction in 20 specimens, and Robert's reagent showed 9 to be positive. In our opinion Exton's reagent is the most selective test for true albuminuria.

In general, it can be said that some specimens from the control group were positive to the nitric acid and heat test and to Robert's reagent. Nevertheless, the incidence of positive reactions was greater after the ingestion of any of the three mediums. This indicates that all of the albumin-testing reagents are likely to produce some false positive reactions for albuminuria after the ingestion of these gallbladder mediums.

Iodoalphionic acid and Monophen are eliminated primarily by the urinary system,[3] while Telepaque is reported to be eliminated primarily by the gastrointesti-

TABLE 1.—*Incidence of Pseudoalbuminuria Following Ingestion of Iodoalphionic Acid (Priodax), Monophen, and Telepaque**

Laboratory Test	Control Group with No Medium	% Positive with		
		Iodoalphionic Acid †	Monophen †	Telepaque
Exton's reagent (hot)..	0	14	17	15
Exton's reagent (cold).	9	60	65	43
Heller's ring test.....	0	10	10	1
HNO_3 and heat test...	20	43	39	36
Robert's reagent.....	9	72	82	15

* Each medium was given to a separate group of 100 patients.
† Studies of these mediums were previously reported.[3]

TABLE 2.—*Side-Reactions Following Ingestion of Iodoalphionic Acid (Priodax), Monophen, and Telepaque**

Side-Reaction	Iodoalphionic Acid †	Monophen †	Telepaque
Dysuria	48	23	29
Diarrhea	38	13	39
Abdominal cramps.....	21	19	29
Headache	21	27	29
Nausea	17	28	17
Dizziness	15	14	16
Allergic phenomena.....	4	7	4
Visual disturbance.....	2	4	6
Vomiting	0	0	1
Miscellaneous reactions.....	4	0	4

* Each medium was given to a separate group of 100 patients.
† Studies of these mediums were previously reported.[3]

Telepaque tablets for this study were donated by Winthrop-Stearns, Inc., New York.

From the Department of Radiology (Drs. Seedorf and Dysart), the Department of Clinical Pathology (Dr. Powell), and the Department of Medicine (Dr. Greenlee) of the Scott and White Clinic.

1. Seedorf, E. E.; Powell, W. N.; Greenlee, R. G., and Hartman, J. T.: Priodax and Pseudoalbuminuria, Radiology **55**: 740-742 (Nov.) 1950.

2. Seedorf, E. E.; Powell, W. N.; Greenlee, R. G., and Dysart, D. N.: Pseudo-Albuminuria Following Monophen and Priodax, Radiology **59**: 422-423 (Sept.) 1952.

3. Modell, W.: The Pharmacology of β (3,5 Di-iodo-4-hydroxy-phenyl) α Phenyl Proprionic Acid, J. Lab. & Clin. Med. **27**: 1376-1384 (Aug.) 1942. Wasch, M. G., and Epstein, B. S.: Monophen: A New Medium for Oral Cholecystography, Am. J. Roentgenol. **66**: 98-102 (July) 1951.

nal tract.[4] We anticipated a reduced incidence of dysuria and an increased incidence of diarrhea with the use of Telepaque, but our results failed to support this assumption. In general, the frequency of side-reactions was relatively the same after the use of all three mediums.

In this study, as with iodoalphionic acid and Monophen, the presence or absence of pathological findings on the cholecystogram was not related to the occurrence of pseudoalbuminuria. The urine specimens of four patients continued to show presence of Telepaque for three days after ingestion, but were free of the drug on the fourth day. Apparently, because of the greater amount of dye in proportion to body weight, the incidence of pseudoalbuminuria was higher in the lighter weight patients.

As mentioned previously, only 2 gm. of Telepaque gave a gallbladder shadow of as great or greater density than 3 gm. of iodoalphionic acid or Monophen; 97 of the 100 cholecystograms showed normally functioning gallbladders, and 3 cholecystograms showed nonfunctioning gallbladders. Calculi were visualized on seven of the films showing normal function and on two of the films showing nonfunctioning gallbladders.

From extensive experience, we have established what we consider the average normal density of cholecystograms produced with iodoalphionic acid. In our series with Telepaque, we considered about one-half of the cholecystograms slightly to considerably denser than those produced with the other two mediums. The cystic duct was visualized in 10 patients; 9 had gallbladder shadows of increased density. Whereas, the denser gallbladder shadow produced by Telepaque has certain advantages, it may also produce too dense a shadow, obscuring gallstones. We have not encountered this difficulty with the dosage employed. Unlike the other two mediums, Telepaque is commonly seen in the gastrointestinal tract for two or three days after ingestion. It can usually be distinguished from gallstones when it overlies the gallbladder, but in 13 of our patients it was necessary to make that distinction. In our clinic, abdominal flat plates and lumbar spine roentgenograms are usually made after cholecystography. A residue of Telepaque was seen in 92 patients who had roentgenograms of the abdominal region after cholecystography, and occasionally, another film was necessary to exclude the possibility of urinary or other abdominal calculi.

SUMMARY

Since the incidence of pseudoalbuminuria is high enough to cause erroneous impressions, urinalyses taken on the day after and, occasionally, two or three days after cholecystography employing iodoalphionic acid (Priodax), Monophen (2-[4-hydroxy-3,5-diiodobenzyl]-cyclohexane carboxylic acid), or Telepaque (3-[3-amino-2,4,6-triiodophenyl]-2-ethylpropanoic acid) should be interpreted with caution. Side-reactions and their frequency were relatively the same after the use of all three mediums but were not severe enough to contraindicate use.

Good cholecystograms were produced by all three mediums. In our experience, a smaller dosage of Telepaque than of the other two mediums was advantageous. Undesirable results of the use of Telepaque were a residual deposit in the bowel and occasional interference with interpretation of renal or other calculi.

213 W. Avenue G.

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METHOD AND MACHINE FOR RESUSCITATION OF THE NEWBORN

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One of the objections to mechanical resuscitators in general is that in their use oxygen is applied to the infant by face mask without investigation of the condition of the airway. It is obvious that not only is any machine that is applied to a child who has an obstructed airway ineffective but the time loss due to airway obstruction may be fatal. The establishment and maintenance of a free airway is of first importance; without it no method can succeed. The entire respiratory tract must be cleared of obstructing fluid or mucus. Obstruction due to spasm of the glottis, if present, must be overcome. This condition may result from an irritating mucus plug or from certain types of anesthetic agents administered to the mother. Infants in the stage of flaccidity with collapsed glottic structures and absent reflexes may also have obstructed airways. Intubation of the trachea is the only method of dealing with these situations.

There is considerable controversy over the ease and safety of intubation. Much of this controversy is a result of a gross misunderstanding of the problem at hand. There are two points to be made: 1. In cases where obstruction is definitely present intubation must be done whether it is easy or difficult. 2. The procedure of intubating the infant has been made unnecessarily difficult owing to a lack of understanding of a few simple principles. The commonest mistake is that of lowering the head over the edge of the table to put it in a position of hyperextension, supposedly to help visualize the glottis. This is an incorrect procedure.

METHOD OF INTUBATION

The child should lie flat on its back, with the back of the head flat on the table. The tip of the blade of an infant laryngoscope (Foregger is my preference) is inserted to the glottis. The handle of the laryngoscope is then lifted vertically. This brings the glottis to view, and the catheter is inserted without trauma.

There are still some who object to intubation but practice mouth-to-mouth insufflation. The inadequacies and dangers of this method include the lack of control of the pressure applied. When intubation is a must, the tracheal catheters herein described give maximal efficiency and safety in use.

THE MACHINE

The machine, which is entirely manually controlled, has been devised to overcome the objections to automatic devices, many of which contain multiple working parts, resulting in the machine frequently getting out of order. Dependability is essential in a machine used mainly in emergency. Owing to the danger of oxygen

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delivery by mask, the machine is supplied with equipment for tracheal intubation to permit suction clearing and the direct administration of intratracheal oxygen. Mask attachment is also supplied for use when intratracheal administration is unnecessary.

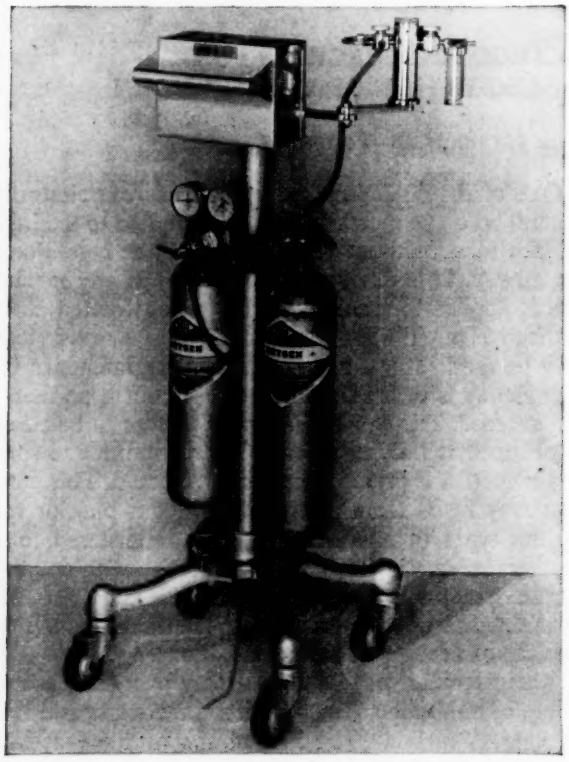

Fig. 1.—Machine used in resuscitation of the newborn infant.

The machine is a self-contained unit mounted on a heavy base with freely wheeling casters (fig. 1). Oxygen is supplied from two tanks, one in operation and the second a spare, always available. The oxygen is delivered to the resuscitation head through a standard reducing valve. A small built-in cabinet provides storage space for a laryngoscope and spare batteries, intratracheal catheters in graduated diameters, no. 4, 5, 6, and 7 (fig. 2), and a face mask. The head consists of a manually controlled suction bulb for removal of mucus; a removable, transparent, plastic drainage trap (no mucus can enter the oxygen administering valve), and a resuscitating valve of a simple, single chamber, two port, ball valve construction. It is simply a positive and negative resuscitating safety valve. The valve is a ball type, bronze construction. There are no washers, springs, hinges, or any other parts to get out of order or require replacement. In construction, the valve is designed to deliver a positive oxygen pressure of 12 mm. Hg and a negative pressure of 8 mm. Hg. No setting is necessary, and no change of these pressures can be made. Even with gross pressure ranges at the reducing valve these positive and negative pressures applied to the infant cannot be altered. Any excess oxygen merely escapes into the air.

The administration of oxygen and the switch to negative pressure is regulated by a manual control marked positive and negative. The rate of alternation from positive to negative pressure is entirely under the operator's control, which is a distinct advantage over automatic control. The manual control regulates the rate of alternation only. When on positive, the pressure is always 12 mm. Hg, never more nor less. Similarly, on negative, the pressure is always 8 mm. Hg, never more or less. There is no neutral or dead spot on the control. It is either positive or negative. (The negative pressure is created from the positive reduced tank pressure by the Venturi attachment.) No two resuscitation problems are alike. Each case requires individual treatment, which cannot be accomplished by automatic mechanical devices. The sooner this fact is realized and accepted the sooner will resuscitation salvages increase and disasters be avoided.

APPLICATION OF THE APPARATUS TO THE METHOD OF RESUSCITATION

As soon as the child is delivered, mucus should routinely be removed from the nasal passages and pharynx. If the infant does not breathe spontaneously there is no use wasting time with obsolete dangerous methods, nor is it permissible to attempt the administration of oxygen to an infant until a clear airway has been established. The passage of an intratracheal catheter is a procedure that requires more gentleness than skill. The minimal amount of manual dexterity required for introducing the catheter can readily be accomplished by anyone who has arrived at the station of assuming the responsibility for the care and management of the newborn infant. The catheters supplied with the apparatus greatly facilitate this procedure. The catheters are supplied in graduated diameters, and the length from hilt to tip is designed to permit an adequate descent into the trachea without encroachment on the coruna. They are metal and designed to prevent trauma. The metal construction provides rigidity to facilitate control, and the thin wall permits a maximal lumen. The hilt provides a side handle that removes the

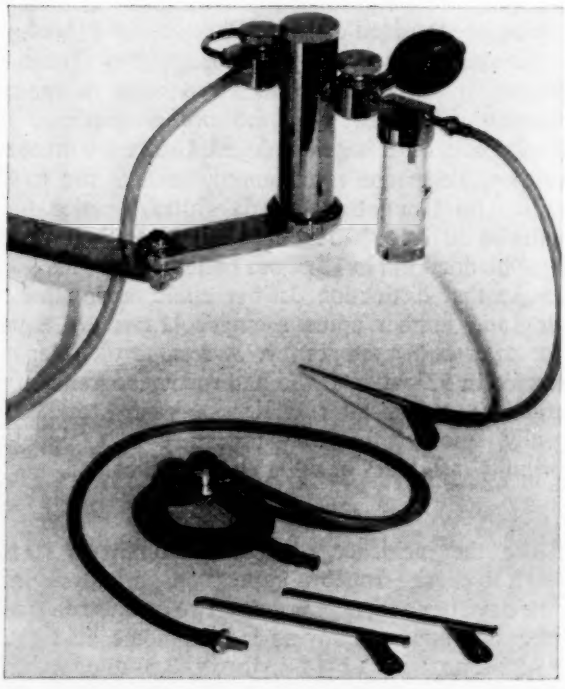

Fig. 2.—Intratracheal catheters in graduated diameters and the head of the resuscitation machine.

operator's fingers from obstructing the field of vision during insertion.

With the catheter in place the suction valve is opened, bulb section is applied to remove mucus, and the suction valve then closed. With the reducing valve registering about a 3 to 4 liters per minute flow of oxygen, the alternating positive and negative pressures to instigate respiratory movements are under the operator's control. Alternations of 10 to 15 per minute are adequate and give the child a much better chance of establishing his own respiratory rate than more rapid artificial movements. As long as the child's color is improving, the depth of respiratory movements is of no concern. The apparatus is delivering to the lung alveoli 100% oxygen. When respirations are established the catheter is removed. If the child is not robust and additional oxygen is indicated it may be administered with the face mask. A longer tube for attachment to the mask is provided for administering continuous oxygen to the child in the crib if necessary.

This apparatus and method of resuscitation is accepted and endorsed by the department of obstetrics and gynecology and the department of anesthesia, University of Toronto, Canada. In the two years that the instrument has been used in the Toronto General Hospital it has never been found to be out of order. There have been no mechanical breakdowns of any kind and no maintenance or service work required. This continued performance may be expected indefinitely. There has been no occasion to alter in any way the original design of the machine.

TEACHING AUSCULTATION BY ENDLESS LOOP TAPE RECORDING

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Auscultation is the most satisfactory means of evaluating heart sounds and murmurs. The object of modern teaching is to bring about proficiency in auscultation through good training. It still remains a contemporary practice, however, to teach auscultation to small groups of students at the patient's bedside. This method is entirely dependent on available clinical material, and it is not unusual for students to enter the practice of medicine without ever having heard the bruit of a patent ductus arteriosus or the sound of a pericardial friction rub. Even if the desired material is at hand, students frequently react to the pressure of colleagues who await their turn to listen by hurrying through the examination without understanding what is heard, or patients often resist these repeated examinations and encourage careless haste. When teaching is restricted to clinical material, an opportunity to compare different sounds and murmurs is seldom offered at the time confusion first arises. Unless the work at the patient's bedside is carefully guided, misconceptions become fixed errors. In providing the constant supervision necessary, a teaching staff may be heavily overburdened. It is possible to meet these problems in teaching by making use of reproductions of heart sounds and murmurs. These may be graphic or auditory.

Phonocardiography is the graphic registration of the vibrations of heart sounds and murmurs. When the recording is done with a stethoscopic microphone, a record is obtained of all the vibrations that would reach the ear through the stethoscope, including the low-pitched tones that are not actually heard. The logarithmic microphone records the vibrations of only those sounds that are actually heard. Regardless of which microphone is used, the written record cannot serve as a substitute for an actual auditory reproduction, for the sense of hearing is best trained by listening. It is obvious that the description of the taste of an apple is a poor substitute for the experience of eating the fruit. Teaching methods that use actual sound reproductions are the most efficient for teaching students and physicians the art of auscultation.

By means of a microphone that will respond to low frequency sounds, it is possible to record heart sounds and murmurs on phonograph records.[1] Rappaport and Sprague [2] have shown that practically all heart sounds and murmurs are less than 2,000 cycles per second and that adequate means to record these frequencies must be used. Since a special playback is not required, these records may be played wherever a phonograph is available. They make possible the demonstration of types of heart sounds and murmurs that may not be ordinarily available and, if an explanatory script is included with the recording of the heart sounds, an intimate form of teaching is preserved. Phonograph records, however, have several failings. Each record contains many types of heart sounds and murmurs. When demonstrating to a large group, it is difficult to find a specific illustration without including other, perhaps confusing, material. Furthermore, it is impossible to play any single example continuously so that it may be mastered by repetition. Experience has shown that phonograph records are beneficial for individual rather than for group instruction. Records may be kept in a small room with special acoustic features or in a special section of the medical library to be used by students as reference material to supplement or clarify auscultatory findings in a patient.

A student's difficulty in learning the technique of auscultation very often arises on occasions when the heart rate is too rapid to permit recognition of a murmur and when a murmur cannot be separated from the accompanying heart sound. Heart rates cannot be satisfactorily reduced, and murmurs cannot be separated from heart sounds on phonograph records. Teaching cardiac auscultation has been greatly improved by the use of endless loops of tape on which heart sounds, murmurs, and arrhythmias have been recorded. This method of instruction has been more effective in teaching large groups of students and physicians than has the bedside demonstration of patients and the use of phonocardiograms or phonograph records. It does not require visual or pal-

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This project was supported in part by a training grant from the National Heart Institute, United States Public Health Service.

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patory teaching aids; although these aids may be used as adjuvants, we feel strongly that they should not be used simultaneously with the playing of heart sounds. Auditory, visual, and palpatory stimuli have different reaction times, and, if shown simultaneously with auditory phenomena, they may result in confusion rather than clarification.

METHOD

The apparatus and the method described have been used successfully at the Hahnemann Medical College of Philadelphia for teaching sophomore and postgraduate students since 1950. The original reel-to-reel tape recordings of normal and abnormal heart sounds, murmurs, and arrhythmias are made in the conventional manner using a dynamic microphone and a tape recorder. The recordings are made in a sound dampened or acoustically equipped room, and, when played back they sound quite like the auscultatory findings heard with a stethoscope.

From these reel-to-reel recordings, continuous loops may be constructed by splicing selected segments of tape that contain several cardiac cycles. If the heart rhythm is regular, this continuous loop is an accurate reproduction of what would be recorded from the precordium over a long period of time.

By means of phonocardiographic study, it has been possible to determine the time that elapses between the first and second heart sounds and between the second and next first heart sound, with the heart beating at different rates. The recording tape runs at a speed of 15 in. (38.1 cm.) per second. With these factors known, it is possible to determine the length of blank tape that must be spliced between the first and second and the second and next first heart sound in order to reduce the cardiac rate of any particular recording. The fidelity of the sounds and murmurs is not affected by this maneuver. Splicing blank tape between murmurs and heart sounds permits them to be heard separately.

APPLICATION

With the utilization of endless loop tape recordings and clinical material, it is routine practice at the Hahnemann Medical College to teach auscultation to sections of 40 students during eight two-hour sessions. All demonstrations are held in a specially equipped room. Two playbacks are connected in series to the loud speaker. An ordinary cut-in switch permits the demonstration of clinical material, by using a recording microphone with the edges sealed by ordinary rubber tubing. The patient to be demonstrated is well removed from the loud speaker in order to prevent feed-back. Students are instructed to listen for one thing at a time and to approach the auscultatory problem in a routine fashion. In such a manner, first the rhythm is recognized, then the nature of the first and second heart sounds, and finally the presence of systolic and diastolic murmurs. The continuous loop may be played for an indefinite period of time until each student has mastered its lesson. The sounds may be compared with those of any other tape to illustrate a similar or easily confused auscultatory abnormality. They may be compared with the available clinical material through the use of the microphone and cut-in switch. When rapidity of cardiac rate results in confusion, a tape with reduced heart rate may be substituted. For further clarification, murmurs can be played apart from the heart sounds. When this method and material are properly applied, a gratifying proficiency in auscultation may be acquired in a relatively short period of time. Students experience no difficulty in applying their knowledge to stethoscopic examination.

SUMMARY

1. The ordinary methods of teaching auscultation are reviewed, and their shortcomings are noted.

2. The apparatus used to produce endless loop tape recordings is described.

3. The method of producing endless loop tape recordings is described, as well as the method of producing recordings at reduced rates or with murmurs separated from other heart sounds.

4. The advantages of teaching with endless loop recordings are cited.

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CAUSES OF DISABILITY IN PATIENTS WITH CHRONIC DISEASE

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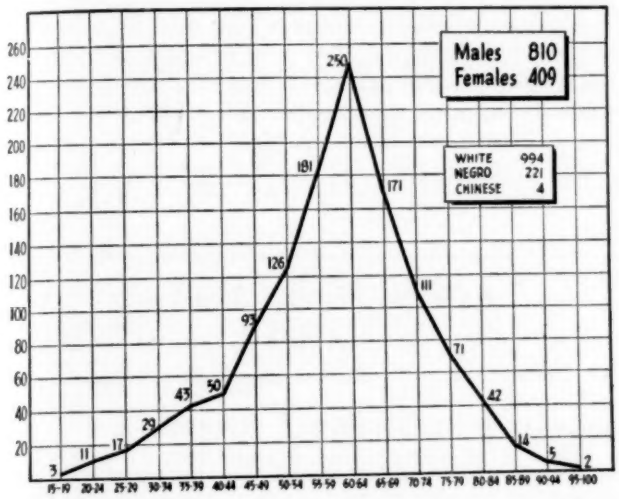
Because interest in the chronic diseases has developed only recently, publications dealing with this subject are scarce. My long experience with chronically ill patients at the Cuyahoga County Nursing Home is, therefore, worthy of presentation. When this large 160 bed, publicly operated institution was established in 1939, a favorable opportunity to observe and study chronic disease was created. Many data on this increasingly important category of diseases have been accumulated during the 13 years that I have been the medical chief at the nursing home.

The present study deals with 1,219 patients, many of whom were given an autopsy, admitted to the home between February, 1939, and December, 1952. In accordance with state regulations, patients admitted to the nursing home are permanently and totally disabled and require active medical supervision and intensive nursing care. Persons with infectious diseases, tuberculosis, or psychoses are ineligible for admission. The type of disabilities found in this chronically ill group does not bear out the prevailing opinion that the leading causes of disability are the degenerative diseases, e.g., cardiovascular diseases, renal disturbances, and arthritis. The patients, preponderantly indigent, are usually referred to the nursing home by a private physician or a general hospital. Because the diagnostic facilities are limited, a complete study of each patient in a general hospital is a prerequisite to admission. Every new patient is examined thoroughly by the resident physician and me. Consultants in neurology, cardiology, and rheumatology make regular visits to the institution. Partly because of the limited diagnostic facilities, but mainly because of the orientation of the staff members and consultants, physical diagnosis has been emphasized. As a result, new diagnostic criteria have been developed in the patients at the home. Infor-

The statistical data for this study were compiled under the direction of Dr. Anna Lewin with the assistance of Dr. B. A. Treister, Director of Physical Medicine, Ursula Rist, Superintendent, Dr. George A. Csanad, and Grace Matsushima.

mation from previous hospital records is incorporated with all other pertinent medical data into the patient's record. Before a definite diagnosis is decided on, the consultants' opinions are taken into consideration. Of course, some diagnoses are changed after a period of observation in the home, but, in the last analysis, the final diagnosis of these patients has been scrutinized most carefully.

The age distribution curve of the 1,219 chronically disabled patients in this study is shown in the figure. The 60 to 64 year category is the peak age, though it can be seen that over one-half of the patients are 50 to 69 years of age. Actually two-thirds of the patients exceed 55 years in age, which is in keeping with the increasing longevity of the present-day population. Although the sex ratio indicates a 2:1 preponderance of males over females in this series (see figure), these figures are not truly representative of the actual sex ratio of chronic illness. It so happens that the wards at the nursing home have been arranged to accommodate twice as many



Age distribution of 1,219 nursing home patients from Feb. 1, 1939, to Aug. 1, 1952.

males, thus accounting for their predominance over females. In view of the 1:4 ratio of Negro to white patients, as compared with an approximately 1:10 ratio in the population at large, it appears that chronic illness is more prevalent in the former.

For the purpose of this study, a special analysis of the major disabling conditions in 431 consecutive patients admitted to the nursing home between January, 1946, and July, 1952, has been made. Having been observed more recently than the group as a whole, i.e., within the past six years, this group has benefited from the newest developments in diagnosis, treatment, and classification of disease. Because of great uniformity in the interpretation of the findings, the conclusions drawn in the smaller group of 431 cases are probably more accurate. Nevertheless, I believe the deductions are equally applicable to the entire series and, in fact, to any comparable series of chronically ill patients. Another reason to accept the validity of the deductions in the smaller group is the remarkable similarity of the age distribution curves of the 431 patients in this report and that based on the 1,219 patients.

PRIMARY DISABILITIES

Multiple diagnoses were the rule in the present group of chronically ill patients. Only the patients' major disease is recorded in the table, the secondary disabilities

Major Causes of Disability of 431 Patients Admitted to County Nursing Home

	No. of Cases	%
Diseases of the nervous system	220	51.0
Cerebrovascular accident	86	20.0
Basal ganglion diseases	34	8.0
Postencephalitic paralysis agitans	21	
Basal ganglion degeneration	9	
Paralysis agitans syndrome	4	
Multiple sclerosis	17	4.0
Central nervous system syphilis	16	3.7
Tabes dorsalis	11	
Dementia paralytica	3	
Central nervous system syphilis	2	
Paraplegia	15	3.0
Lacunar disease	9	2.0
Pseudobulbar paralysis	7	1.6
Peripheral neuropathy	7	1.6
Guillain-Barré syndrome	5	
Others	2	
Dementia	6	1.3
Congenital spastic paralysis	4	0.9
Progressive muscular dystrophy	4	0.9
Amyotrophic lateral sclerosis	3	0.7
Brain injury	2	0.5
Primary cerebellar disease	2	0.5
Psychoneurosis	2	0.5
Cortical degeneration	2	0.5
Brain tumor	1	0.2
Progressive spinal atrophy	1	0.2
Syringomyelia	1	0.2
Combined systems disease	1	0.2
Malignant tumors	75	17.0
Carcinoma	72	
Lymphosarcoma	1	
Hypernephroma	2	
Amputations	29	7.0
Bilateral	8	
Unilateral	19	
Of the toes	2	
Congestive heart failure	25	6.0
Rheumatoid arthritis	19	4.0
Severe starvation	9	2.0
Fractures and improper healing	7	1.6
Chronic lung diseases	6	1.3
Bronchiectasis	1	
Asthma	3	
Fibrosis of lungs	2	
Hypertrophic arthritis	4	0.9
Cirrhosis of the liver	4	0.9
Tuberculosis of the bones	4	0.9
Chronic venous insufficiency	4	0.9
Deafness	4	0.9
Blindness	4	0.9
Occlusive peripheral vascular disease without amputation	3	0.7
Urinary incontinence	3	0.7
Due to indwelling catheter	2	
Due to ureterosigmoid anastomosis	1	
Diabetes mellitus	2	0.5
Myelogenous leukemia	2	0.5
Chronic osteomyelitis	2	0.5
Nephrosclerosis (malignant)	2	0.5
Osteomalacia	1	0.2
Heart block	1	0.2
Pilonidal sinus	1	0.2

and concomitant diseases being tabulated elsewhere. For example, in a patient with carcinoma of the lung in whom generalized atherosclerosis is also present, the former is

regarded as the major disability and is recorded in the table, while the latter diagnosis does not appear.

It may come as a surprise to many that over one-half, or 51%, of the patients with chronic disability are affected primarily by a disorder of the nervous system. Since patients with psychoses are not accepted in the nursing home, the great majority of these patients have neurological disorders. The commonest neurological disability, by far, is the cerebrovascular accident (hemiplegia, stroke, or apoplexy), affecting one out of five patients admitted to the home. Also, this disorder constitutes the greatest single disability in two out of every five patients with neuropsychiatric diagnoses. Because the majority of the cases of cerebrovascular accident are caused by thrombi secondary to cerebral atherosclerosis, such patients may also be classified under atherosclerosis. Other frequently encountered neurological disabilities are diseases of the basal ganglions, central nervous system syphilis, multiple sclerosis, and peripheral neuropathy, although it can be seen in the table that almost every known neurological entity can be found among this large segment of admissions.

Second to the neuropsychiatric impairments in importance are malignant tumors, mainly carcinomas, which constitute 17% (75 cases) of the 431 patients in this study. The significance of this condition as a leading cause of prolonged disability requires no further comment. In third and fourth places, respectively, among the leading cause of prolonged disability are two other sequelae of atherosclerosis, namely, amputations and congestive heart failure. Still, compared to the frequency of the neurological diseases and malignancy, the relatively low incidence of these two conditions is worthy of note. This also holds true for rheumatoid arthritis, the fifth ranking cause of disability in this series. Because this condition can be so disabling, an institution such as the nursing home, so well suited to the management of such patients, receives a large share of the cases in this community. In view of this, the low incidence of rheumatoid arthritis, compared with the other conditions treated at the home, is totally unexpected. Actually advanced malnutrition (starvation) proves to be the sixth commonest primary disability in this series of patients. Although there were nine such cases, or 2%, in the group, these figures do not emphasize adequately the true importance of malnutrition in patients in whom other diseases have been listed as the major disability.

The remaining major disabilities listed in the table are scattered among many unrelated diseases. Despite its prevalence in the general population, hypertrophic arthritis proves to be a no more frequent cause of primary disability than cirrhosis of the liver, bone tuberculosis, chronic venous insufficiency, deafness, and blindness. In contrast to its high incidence in the general population, diabetes mellitus per se is not a disabling condition. The leading complications of diabetes producing disability, i.e., gangrene and coronary artery disease, are classified here under these categories when they occur and not under diabetes mellitus. There was an extremely low incidence in these patients of diseases of the gastrointestinal tract and the hematopoietic system as major disabilities.

The apparent discrepancy between the high incidence of atherosclerosis in patients of these age groups at autopsy and their low incidence as a cause of disability in this study deserves comment. The data in living disabled patients do not necessarily conflict with the postmortem findings, since there is also a very high incidence of proximal, peripheral, and coronary atherosclerosis (65% of the patients). It should be pointed out, however, that a patient with atherosclerosis is not disabled until one or more arteries supplying a vital area are occluded. Inasmuch as this study deals with functional impairment only, the incidence of disability following arterial occlusion as reported here need not parallel the frequency of atherosclerotic complications found at autopsy.

In the present study when all the major disabilities caused by atherosclerosis, i.e., thrombotic cerebrovascular accidents, cardiac failure, and amputations, are combined, they add up to 30% of the 431 patients. On further analysis it is found that two-thirds of these cases are cerebrovascular accidents and the remaining one-third are divided between cardiac failure and amputations. One must conclude, therefore, that as a cause of disability the cerebrovascular accident is far more prevalent than coronary sclerosis despite the high rank of the latter as a cause of death in this country.

2905 Franklin Ave.

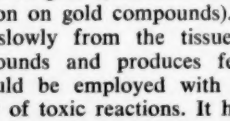
COUNCIL ON PHARMACY AND CHEMISTRY

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

R. T. STORMONT, M.D., *Secretary.*

Aurothioglycanide.—Lauron (Endo).—α-Auromercaptoacetanilid.—C_8H_8AuNOS.—M.W. 363.42.—The structural formula of aurothioglycanide may be represented as follows:



Actions and Uses.—Aurothioglycanide, a water-insoluble gold compound, is used for the treatment of rheumatoid arthritis on the same basis and subject to the same precautions as water-soluble salts of gold. (See New and Nonofficial Remedies under the section on gold compounds). Aurothioglycanide is absorbed more slowly from the tissues than are water-soluble gold compounds and produces fewer untoward reactions, but it should be employed with similar caution to avoid the possibility of toxic reactions. It has not been shown to be more effective than other gold compounds. Careful supervision, repeated laboratory examinations which will reveal signs of gold intoxication, and avoidance of exposure to sunlight, ultraviolet rays, or x-rays are essential as with the use of other forms of chrysotherapy.

Dosage.—Aurothioglycanide is administered into the gluteal muscle by injection of a suspension in oil. The initial dose should not exceed 25 mg. This is gradually increased as tolerated by increments of not more than 25 mg. administered

at weekly intervals for 22 weeks. However, a maximum single dose of 150 mg. should not be exceeded. When untoward effects are observed, the schedule of weekly injections should be interrupted until such manifestations have disappeared.

Tests and Standards.—

Physical Properties: Aurothioglycanide is a grayish-yellow powder, m.p. 238.0-241.0°. It is insoluble in acids, bases, benzene, ether, chloroform, and water.

Identity Tests: The procedure described for the determination of gold under Assay serves as an identity test.

Place in a test tube about 15 mg. of aurothioglycanide. Add 5 ml. of a 4% solution of selenium oxychloride in sulfuric acid: a deep red color develops (*presence of gold*).

Purity Tests: Dry about 1 gm. of aurothioglycanide, accurately weighed, at 105° for 4 hours: the loss in weight does not exceed 0.2%.

Assay: (Gold) Transfer to a porcelain crucible about 0.3 gm. of aurothioglycanide, accurately weighed. Heat slowly, to avoid splattering, until the compound is completely decomposed, then increase the heat until a homogenous residue of metallic gold is obtained. Cool in a desiccator and weigh. Each gram of gold formed is equivalent to 1.843 gm. of aurothioglycanide. The amount of gold is not less than 53.3 nor more than 55.0%, equivalent to not less than 98.0 nor more than 101.0% of aurothioglycanide.

Dosage Forms of Aurothioglycanide

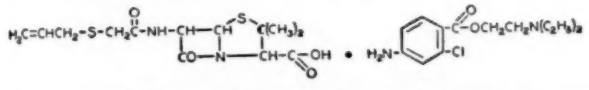
SUSPENSION. *Identity Tests:* The suspension responds to the identity tests for the active ingredient in the monograph for aurothioglycanide.

Assay: (Gold) Transfer to a tared sintered glass crucible of fine porosity an amount of suspension, accurately measured, equivalent to about 0.45 gm. of aurothioglycanide. Filter by suction and wash the aurothioglycanide with five 10 ml. portions of acetone. Proceed as directed in the assay for gold in the monograph for aurothioglycanide starting with, "Heat slowly to avoid splattering . . ." Each gram of gold formed is equivalent to 1.843 gm. of aurothioglycanide. The amount of aurothioglycanide is not less than 95.0 nor more than 105.0% of the labeled amount.

Endo Products, Inc., Richmond Hill, N. Y.

Suspension Lauron in Oil: 5 and 10 cc. vials. A suspension in sesame oil containing 50 and 150 mg. of aurothioglycanide in each cubic centimeter. U. S. patent 2,451,841. U. S. trademark 398,432.

Chloroprocaine Penicillin O.—Depo-Cer-O-Cillin Chloroprocaine (Upjohn).—A crystalline salt of 2-chloroprocaine and penicillin O. The structural formula of chloroprocaine penicillin O may be represented as follows:



Actions and Uses.—Chloroprocaine penicillin O, a water-insoluble salt of penicillin O, has the same spectrum of antibacterial activity as other salts of penicillin O and penicillin G. (See New and Nonofficial Remedies under the monographs on penicillin G and potassium penicillin O.)

The intramuscular injection of chloroprocaine penicillin O, as a suspension dispersed in water, results in the formation of a depot of penicillin O, similar to that produced by corresponding preparations of procaine penicillin G. The levels of antibiotic in the blood produced by intramuscular injections of an aqueous suspension of chloroprocaine penicillin O are approximately equal to those obtained by a similar injection of an aqueous suspension of procaine penicillin G. With aqueous chloroprocaine penicillin O, the levels of the antibiotic in the blood usually persist for about 24 hours as compared to 12 to 18 hours with aqueous procaine penicillin G.

As with soluble salts of penicillin O, the majority of patients sensitive to salts of penicillin G will tolerate chloroprocaine penicillin O without allergic reactions; however, some patients may be sensitive to both penicillin G and penicillin O. In such patients another antibiotic should be used.

Dosage.—Chloroprocaine penicillin O is administered intramuscularly as an aqueous suspension containing 300,000 units per cubic centimeter. In acute staphylococcic, streptococcic, and pneumococcic infections, the minimum dosage is 300,000 units injected once daily and continued until the temperature has returned to normal for at least 48 hours and evidence is present that the infection is disappearing. When these infections are severe, 600,000 units every 12 hours may be employed, or replaced by injections of a solution of potassium penicillin O at shorter intervals. In acute gonorrhea, a single injection of 300,000 units is usually sufficient to effect a cure, but patients who fail to respond should be retreated until a cure has been achieved. In chronic gonorrhea accompanied by complications, higher doses and more prolonged therapy may be required. In the treatment of gonorrhea the possible masking effect of penicillin on the early signs of syphilis should be kept in mind; appropriate tests should be instituted to confirm or exclude the presence of that disease.

Aqueous suspensions may be kept at room temperature for three weeks without a significant loss of potency and without caking. If refrigerated, the suspension should be gradually warmed prior to injection and shaken vigorously to make certain that all of the penicillin is in suspension. Excessive heating should be avoided to prevent destruction of the physical or antibacterial properties of the suspension.

The Upjohn Company, Kalamazoo, Mich.

Depo-Cer-O-Cillin Chloroprocaine: 1,500,000 unit vials of chloroprocaine penicillin O. U. S. trademarks 515,760 and 554,422.

Estrone-U.S.P. (See New and Nonofficial Remedies 1953, p. 357).

Eli Lilly & Company, Indianapolis.

Solution Estrone in Oil: 10 cc. vials. A solution in sesame oil containing 1 mg. (10,000 I. U.) of estrogenic activity in each cubic centimeter.

Isoniazid (See New and Nonofficial Remedies 1953, p. 85).

Premo Pharmaceutical Laboratories, Inc., South Hackensack, N. J.

Tablets Nicozide: 50 and 100 mg.

Mephenesin (See New and Nonofficial Remedies 1953, p. 466).

Hexagon Laboratories, Inc., New York.

Powder Mephenesin: Bulk; for manufacturing use.

E. S. Miller Laboratories, Inc., Los Angeles.

Tablets Tolulexin: 0.25 gm.

Mercurophylline Sodium (See New and Nonofficial Remedies 1953, p. 305).

Lincoln Laboratories, Inc., Decatur, Ill.

Solution Mercurophylline (Sodium): 1 cc. and 2 cc. ampuls. A solution containing 0.14 mg. of mercurophylline sodium (equivalent to 39 mg. of mercury) in each cubic centimeter.

Normal Human Plasma-U.S.P. (See New and Nonofficial Remedies 1953, p. 213).

Courtland Laboratories, Los Angeles.

Normal Human Plasma (Lyophilized): 50, 250, and 500 cc. bottles of dried plasma, packaged with an air filter, double pointed needle and 50, 250, and 500 cc., respectively, of 0.1% citric acid solution for restoration.

Phenindione (See THE JOURNAL, May 9, 1953, p. 142).

Schieffelin & Company, New York.

Tablets Danilone: 50 mg.

Piperazine Estrone Sulfate (See New and Nonofficial Remedies 1953, p. 365).

Abbott Laboratories, North Chicago, Ill.

Elixir Sulestrex Piperazine: 118 cc. bottles. A flavored elixir containing 0.3 mg. of piperazine estrone sulfate in each cubic centimeter.

Pyridoxine Hydrochloride (See New and Nonofficial Remedies 1953, p. 493).

E. S. Miller Laboratories, Inc., Los Angeles.

Tablets Pyridoxine Hydrochloride: 10 mg.

Sulfisoxazole (See New and Nonofficial Remedies 1953, p. 105).

Hoffmann-LaRoche, Inc., Nutley, N. J.

Suspension Gantrisin Pediatric: 118.3 and 473 cc. bottles. A suspension containing 0.1 gm. of sulfisoxazole in each cubic centimeter. Preserved with 0.08% methylparaben and 0.02% propylparaben.

THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION
535 N. DEARBORN ST. . . . . CHICAGO 10, ILL.
Editor . . . . . AUSTIN SMITH, M.D.
Associate Editor . . . . . JOHNSON F. HAMMOND, M.D.
Editor for Medical Literature Abstracts . GEORGE HALPERIN, M.D.

Subscription price . . Fifteen dollars per annum in advance
Cable Address . . . . . "Medic, Chicago"

ACUTE RENAL FAILURE

The syndrome of acute renal failure, as seen in crush injuries, was first reported in 1941 by Bywaters and Beall [1] in the *British Medical Journal*. The subject was editorially considered in THE JOURNAL, September 20, 1941.[2] After recovery from the initial shock, in the patients observed oliguria developed, with blood, albumin, and many dark brown and black granular casts. The blood urea and potassium became progressively higher, and death occurred within a week. Necropsies revealed necrosis of the crushed muscle and degenerative changes in the renal tubules. Lauson and his co-workers [3] studied the changes in renal vascular dynamics resulting from peripheral circulatory failure in 35 human cases by means of the clearance methods. Their investigation confirmed the hypothesis that the urinary findings in shock, namely, oliguria and anuria and loss or impairment of concentrating power, are the result of decreased circulation through the kidneys. Oliver and his coworkers [4] demonstrated that the functional and structural alterations in the kidney in the case of acute renal failure caused by toxic or traumatic injuries are those of a tubular nephropathy. The pathogenesis was the same in such clinically different entities as crush injury, transfusion reactions, obstetric accidents, and fatal poisonings. The lesions involved the renal tubules and consisted of disseminated areas of epithelial degeneration, necrosis, and basement membrane rupture.

Swann and Merrill [5] review the literature and their own observations on 100 patients with acute renal failure who have been admitted in the past four years to the Peter Bent Brigham Hospital. The clinical course of this apparently new syndrome is characterized by a period of severe oliguria of a few days' to a few weeks' duration, associated with increasing clinical and chemical evidence of renal failure and followed by a period of rapidly returning function and excretion of water, inorganic ions, and metabolites accumulated during the oliguric period. Oliguria, proteinuria, hematuria, and decreasing urinary specific gravity usually begin within hours of the causative event.

The oliguric phase is followed by the diuretic phase, the period during which clinical improvement and the return of renal function is rapid. Swann and Merrill [5] stress that the transition from the oliguric to the diuretic phase is of major importance in limiting the incidence of the morbidity and mortality from the complications of the oliguric phase. The average duration of oliguria in acute renal failure is about 10 to 12 days. During this phase symptoms and signs are those of cardiovascular, gastrointestinal, and neuromuscular dysfunction. Recognition that after the onset of acute renal failure cardiac function and not the renal function becomes the major concern of the clinician has been according to Swann and Merrill [5] the most important clinical advancement in the past 10 years in the management of this condition. Cardiac dysfunction is the most serious complication of acute renal failure and is the principal cause of death. Two types of cardiac dysfunction are recognized in acute renal failure. The first and commonest form results in pulmonary edema. The second is represented by a cardiac condition associated with hyperkalemia. Pulmonary congestion is a frequent and dangerous complication.

The cerebral complications are those of somnolence, which usually begins toward the end of the first week of oliguria and may progress to stupor, delirium, and coma. Marked delirium and convulsions in the series of Swann and Merrill [5] all appeared to be due to excess administration of water and sodium. Leukocytosis is almost always present early in the oliguric phase. Fever usually follows the initial injury or illness and is present only in the first few days. Rapidly progressing anemia is one of the most constant features of the clinical course. In the oliguric phase, hyponatremia usually occurs with hyperkalemia.

Potassium intoxication is recognized by alterations in the sensorium and by signs of cardiovascular and neuromuscular dysfunction. Cardiovascular signs include faint heart sounds, falling arterial blood pressure, decreasing pulse rate, arrhythmia, periods of asystole, and circulatory collapse. Alterations in the sensorium include anxiety and restlessness progressing to extreme apprehension, sweating, stupor, and terminal convulsions. Neuromuscular signs are those of weakness and hyporeflexia progressing to paralysis of the limbs and of respiration and areflexia, and of paresthesias of the extremities, lips, and tongue, progressing to anesthesia.

Delirium, convulsions, pulmonary edema, vomiting and diarrhea, severe epistaxis, and other manifestations of renal insufficiency may first appear after the onset of the diuresis, even though the daily renal volume exceeds a liter. Patients recovering from acute renal failure show a delayed or blunted response of urinary flow to water intake. A low-grade fever, usually beginning in the second week of the diuretic phase, is characteristic of the course. Marked anemia persists for weeks or months after recovery.

The therapy of acute renal failure has undergone considerable modification because of the recognition that an organic lesion requiring repair is responsible for oliguria. Renal decapsulation and diuretic agents to stimulate urinary flow have been abandoned. Attempts to

1. Bywaters, E. G. L., and Beall, D.: Crush Injuries with Impairment of Renal Function, Brit. M. J. **1**: 427 (March 22) 1941.
2. Renal Failure in Crush Injuries, editorial, J. A. M. A. **117**: 1019-1020 (Sept. 20) 1941.
3. Lauson, H. D.; Bradley, S. E., and Cournand, A.: The Renal Circulation in Shock, J. Clin. Invest. **23**: 381-402 (May) 1944.
4. Oliver, J.; MacDowell, M., and Tracy, A.: The Pathogenesis of Acute Renal Failure Associated with Traumatic and Toxic Injury: Renal Ischemia, Nephrotoxic Damage and the Ischemuric Episode, J. Clin. Invest. **30**: 1307-1438 (Dec.) 1951.
5. Swann, R. C., and Merrill, J. P.: The Clinical Course of Acute Renal Failure, Medicine **32**: 215-292 (May) 1953.

induce a greater urinary flow during the oliguric phase may be hazardous. The therapeutic objective is to enable the patient to survive the oliguric period.

A NEW LOOK AT PRICES

Elsewhere in this issue (page 1365) is an analysis from the Bureau of Medical Economic Research of the American Medical Association of the effects on indexes of medical care prices, including fees, of the shifting of the base period from 1935-1939 to 1947-1949, for indexes of consumer prices of the Bureau of Labor Statistics of the United States Department of Labor. The author points out that revisions in the indexes and the addition of approximately 100 commodities and services —such as television sets, frozen foods, and nylons—are genuine improvements. He questions, however, the wisdom of using this new base period, because, for one reason, those three years are an interlude in an inflationary trend that has continued into the 1950's. They do not provide a true base period but rather a temporary foothold on an incline of inflation. The reasons given for shifting to the 1947-1949 period by the Bureau of the Budget, which ordered the change, are not conclusive. Admittedly, it is easier to add new commodities and services to the series by adopting a new base period. In this way, a patchwork of revision is avoided. Nevertheless, in the past items have been added to such series by the "splicing-on process," without changing the base period, even though it may be awkward. One wonders, then, if it is possible that 1947-1949 was chosen by the Bureau of the Budget in order to make the high inflationary levels seem more platable to the consumer. Whatever the reason, or reasons, the choice has made some of the indexes seem somewhat ridiculous.

Because medical prices, among others, such as rents, were relatively static prior to 1949, the shift of the base makes them appear to be superficially high in 1951 and 1952. On the other hand, commodities and services whose prices rose rapidly during the inflationary 1940's, such as women's cotton housedresses, men's street shoes, and haircuts, appear to be relatively low in price in 1951 and 1952 solely because of the shift to the new base period, 1947-1949. Are the prices of women's cotton housedresses, men's street shoes, and haircuts moderate today? A shift in statistical compilation will not convince wage-earners that these commodities and services are low-priced. In 1952 the indexes of medical care prices in general and physicians' fees in particular were below the entire Consumers' Price Index computed on the old base period, 1935-1939. On the new base period, however, they are actually above the Index. This reversal of the relative position of medical care prices in relation to the entire Index will doubtless puzzle many physicians who do not carefully read the article on page 1365.

The least that can be done to restore public confidence in the indexes would be for the Bureau of Labor Statistics to release to the press and the public annual summaries on both the old and the new base periods, at least the sections of the index that go back to 1935-1939. The cost would not be a barrier, for the amount of additional work and mimeographing would be negligible.

Sympathetic understanding of the special problems created by the new base period for some users of the indexes and admonitions by the staff of the Bureau of Labor Statistics for such persons to choose their own base period leaves much to be desired, because Department of Labor publicity offices probably will stress the low indexes for haircuts, women's cotton dresses, and men's shoes. News commentators and the press, not aware of the significance of the change in the index base, will repeatedly state that medical care and rent indexes are higher than the entire Index, that the current rise in the Index was paced by rises in these two items, and that the indexes for women's cotton housedresses, men's street shoes, and haircuts are moderately low.

Those economists who have cooperated with the Commissioner of Labor Statistics and his Washington and regional office staffs in facilitating the gathering of monthly and quarterly data on price changes feel that they have earned the right to object to dropping the old base period completely. The Bureau of Medical Economic Research has repeatedly urged busy physicians to give data on prevailing fees to these field representatives. The Bureau intends to continue to cooperate, because the Consumers' Price Index and its breakdowns are valuable tools for economists. Such cooperation is in the public interest. In turn, the Bureau believes it should insist on the presentation of a set of figures that provide a clearer picture of price relationships for a longer period of time than is possible from the new base period.

If this plea is not to be misunderstood, one further comment seems necessary. The income of physicians is determined by collections and output, as well as by fee schedules; only changes in the fees are reflected in the Consumers' Price Index. The survey of physicians' incomes in 1949, a joint study by the United States Department of Commerce and the Bureau of Economic Research, clearly indicated that the average incomes of physicians and of all gainfully employed persons had been increasing at the same pace. Sample studies indicate that this equality in income increases continued through 1951. A moderate increase in fee schedules combined with a higher percentage of fees collected and a phenomenal increase in "output per physician" has enabled physicians to keep close to the center line of the inflationary highway up which the nation has been traveling so rapidly. In making this request to the Bureau of the Budget and to the Department of Labor, no one is looking for an excuse to claim that physicians' fee schedules should rise during a long inflationary period as rapidly as the entire Consumers' Price Index; there merely is the reasonable request that if they have not risen so rapidly this fact should not be concealed from the public by the exclusive use of the 1947-1949 base period in the revised index after January, 1953.

If the Bureau of Labor Statistics refuses to publish the indexes on the old base period at least once each year, some action seems indicated because of the illusion created by shifting to the new base period. The Director of the Bureau of Medical Economic Research in future articles in THE JOURNAL on this subject might well present all indexes on the 1935-1939 base, and other economists may be forced to take a similar position.

ORGANIZATION SECTION

STATEMENT BEFORE HOUSE SUBCOMMITTEE ON HOSPITALS OF THE COMMITTEE ON VETERANS' AFFAIRS

I am Dr. Walter B. Martin of Norfolk, Va., where I am engaged in the active practice of medicine. I am President-Elect and a member of the Board of Trustees of the American Medical Association and am appearing here today (July 13, 1953) as a representative of that Association relative to the hospitalization entitlement of veterans. I am accompanied by Mr. C. Joseph Stetler, Secretary of the Committee on Legislation of the American Medical Association.

At the outset I should like to state that in addition to being a physician I am also a veteran, having served in both World War I and World War II. I can assure you that I am appreciative of the contribution made by men in uniform to their country and the problems, medical and otherwise, which arise during and as a result of their service.

In your letter inviting us to testify certain questions were presented which indicate that the Committee is interested primarily in hospitalization and medical benefits for veterans whose disabilities have no connection with their military service. I shall merely state, therefore, with respect to the care of veterans with service-connected disabilities, that the American Medical Association is and always has been in complete accord with the overwhelming sentiment of the American people that the federal government has a duty to care for any man who has become physically or mentally handicapped as a result of military service.

Inasmuch as your Committee has complete background and statistical information with respect to the eligibility and number of veterans with non-service-conncted disabilities who are receiving hospitalization and medical care, I shall refer to these factors only in general terms. I would, however, like to preface the body of my statement with a brief reference to the history and extent of the interest of organized medicine in this matter.

Since 1925 when the House of Delegates of the American Medical Association registered opposition to the medical provisions of Section 202 of the World War Veterans' Act of 1924, the Association has been in close and constant touch with the medical activities of the Veterans Administration. On more than 30 occasions since that date the House of Delegates and the Board of Trustees have considered various aspects of the program. The most recent action of the Association, which I shall discuss later, was taken by the House of Delegates on June 3 of this year, on the basis of an exhaustive one-year study conducted by a special committee appointed in December, 1951. In accordance with the request contained in your letter of June 22 I have supplied the Clerk of the Committee with sufficient copies of that report to permit complete distribution.

In its deliberations and study of this subject, the Association has worked closely with allied health associations and with major veterans organizations and has considered seriously the views and proposals of each group. Although much discussion has been devoted to the validity of quoted statistics and to the efficiency of the Veterans Administration in the operation of the medical program, it is the belief of the American Medical Association that the really basic questions involved have been ignored.

We feel that the Congress should decide whether existing legislation providing hospitalization and medical care for veterans with non-service-connected disabilities is sound, whether the federal government should continue to engage in a gigantic medical care program in competition with state, local and private medical institutions and whether the ever-increasing cost of such a program is a proper burden to impose on the taxpayers of this country. We further feel that consideration of these problems must be predicated upon a concern for the health and welfare of the entire population and not for just a particular segment.

It is the recommendation of the Association that legislation be enacted limiting medical care and hospitalization benefits for veterans in Veterans Administration and other federal hospitals to the following two categories: (*a*) veterans with peace-time or war-time service whose disabilities or diseases are service-incurred or aggravated; and (*b*) within the limits of existing facilities, to veterans with war-time service suffering from tuberculosis or psychiatric or neurological disorders of non-service-connected origin, who are unable to defray the expenses of necessary hospitalization.

The Association recommends that the provision of medical care and hospitalization in Veterans Administration hospitals for the remaining groups of veterans with non-service-connected disabilities be discontinued and that the responsibility for the care of such veterans revert to the individual and to the community.

The recommendation of the Association with respect to the treatment of veterans with tuberculosis and neuropsychiatric disorders of non-service-connected origin is a temporary one which is believed necessary at this time because of the inadequacy of local facilities designed to provide treatment for all such cases. It is believed, however, that the entire question of whether the care of these patients is a local or federal responsibility must be re-analyzed by the Congress. The rapidly-expanding veterans population and the need for facilities for the remainder of our citizens afflicted with these diseases suggests that community facilities must be developed under state or local administration for the benefit of all. Preferential treatment for veterans with these non-service-connected disabilities cannot be continued indefinitely, in view of the detrimental effect on the health and economy of the entire nation.

Although the initial motivation for the medical program of the Veterans Administration was the desire to provide care for veterans who had become disabled in the course of service to their country, it is now clear that, through congressional acts, administrative interpretations and happenstance, the program has expanded rapidly, primarily during recent years, for the purpose of providing care to veterans whose disabilities have no relationship to military service.

While there may have been sound reasons for originally extending medical care to veterans with non-service-connected disabilities there is considerable doubt that the Congress ever intended that the medical program of the Veterans Administration should develop to its present size. In addition, and of even greater importance, is the obvious fact that if present policies are continued, the federal hospital system devoted to veterans' care will have to undergo considerable further expansion. The ever-increasing number of veterans and the gradual shift in their age distribution to higher age levels with a corresponding increase in chronic disabilities make this expansion inevitable.

It is interesting to note in this connection that there are about 20,000,000 veterans at the present time with an annual increase of approximately 1,000,000. Of this total, approximately 15,000,000 are veterans of World War II, whose average age is about 33 years, compared with 59 years for World War I veterans, and 76 years for Spanish-American War veterans. The Veterans Administration has reported that at the turn of the century there will be almost as many World War II veterans alive (3,404,000) as there are World War I veterans alive today. The average age of the World War II veterans then, however, will be nearly 78.

Before discussing some of the over-all effects of the present medical care program for veterans, I would like to comment on the specific questions presented in your letter of June 22. You inquire particularly concerning contract hospitalization, the establishment of standards for determining eligibility for hospitalization in non-service-connected cases, and whether the possession of health insurance should be a bar to hospitalization in such cases. Although detailed recommendations have not been formulated with respect to all

of these questions, I should like to present the general thinking of the Association.

With respect to contract hospitalization, I am sure it is clear from the above that we would be opposed to the use of this medium to extend the present medical program of the Veterans Administration. If, however, such a device could be employed within the framework of our recommendations as outlined above with a resulting more efficient utilization of existing federal and civilian health facilities, we would favor it.

Inasmuch as we have not studied the various administrative methods for determining "inability to pay" I will refrain from making any specific recommendations in this area.

The last point dealing with the admission of veterans with non-service-connected disabilities into Veterans Administration facilities if they are covered by health insurance is one on which we have taken a definite stand. It is our belief that the institution of such a procedure through legislation would, in effect, amount to a standing offer on the part of the federal government to pay part of the cost of hospitalization and medical care for every veteran suffering from a non-service-connected condition. Such a provision could logically be interpreted as permitting the admission of veterans to Veterans Administration facilities irrespective of their financial status, provided that a portion of the cost of such care could be recovered.

At the present time, administrative regulations are in effect in the Veterans Administration which permit the hospitalization of veterans with prepaid health insurance and the collection of the benefits of such policies by the Veterans Administration.

It is our belief that such a practice is a departure from the original theory of the Congress in providing hospitalization for veterans with non-service-connected disabilities. If such a veteran has the ability to pay for his own hospitalization and medical care through insurance or other assets, it was not intended that he be admitted to a Veterans Administration hospital.

Any complete consideration of the potentialities of the Veterans Administration medical program necessitates a recognition of medical manpower problems, in general, and of the combined effect of the various governmental medical programs on the health of the nation.

Of all of the many important problems that exist in this period of limited mobilization there is none more difficult of analysis and final solution than that of manpower. While it is true that today we have more physicians per thousand population than any other major country and that the productivity of the individual practitioner is constantly increasing, nevertheless the medical manpower situation will be rendered critical if the present rapid uncoordinated expansion of government medical services is allowed to continue.

As the federal government siphons off the medical and allied health personnel needed to meet its continually expanding requirements, the talent available for the civilian population diminishes. This creates an artificial shortage of doctors and other health personnel for the rest of the population. As a result, we continually hear that a shortage of doctors exists. Yet in 1940, before the war, no one maintained that there was such a shortage. In fact, there was a shortage of patients. Many young and well-trained doctors were finding it difficult to establish practices. In 1940 there were 169,628 physicians in the United States. By 1952 the number had increased to 216,200, a gain of 46,572. Thus, although the population of the country had increased by 20 per cent the physician population had increased by 28 per cent.

With respect to the impact of the medical program of the Veterans Administration on civilian health facilities, it should also be noted that this country has developed a large voluntary hospital medical training program that centers around the medical schools and voluntary teaching hospitals. This system is partly supported through the Hill-Burton Act and by various grants to medical schools for research. In addition, however, the federal government maintains five major medical training activities for interns and residents under the Veterans Administration, the Army, Navy, Air Force and the United States Public Health Service. These medical services were designed originally to meet the needs of certain groups. However, their activities have been gradually expanded by drawing into their sphere a constantly increasing number of civilians who previously were cared for by private civilian medicine. Where formerly these services relied on civilian training programs to provide skilled specialists, they have now embarked on training programs of their own. In order to qualify for resident and intern training, it is necessary for service hospitals to provide diversified clinical material. As a consequence there has been increasing pressure to draw into theses hospitals non-service-connected general medical and surgical cases from among the veteran population as well as dependents of service personnel.

As a result, government hospitals are in competition with civilian hospitals not only for personnel but also for patients. Although the federal government, aided by state and local subdivisions, is spending millions of dollars under the Hill-Burton Act in civilian hospital construction it is becoming increasingly dfficult for them to operate at a reasonable cost because patients and health personnel are being diverted into hospitals wholly supported by the federal government. This policy is producing a wasteful duplication of hospital facilities and an unwarranted dispersion of health personnel which not only threatens our great voluntary civilian teaching program but causes a continual increase in the cost of hospital and medical care for persons who must pay their own way.

In its testimony before Congress, and at other times, the American Medical Association has repeatedly pointed out the wastefulness inherent in the present uncoordinated system for providing medical care and hospital benefits by the federal government. The House of Delegates and the Board of Trustees of the Association have, on several occasions, reiterated the belief that one of the ways to institute governmental economy in the use of funds and medical manpower is to establish a Federal Board to allocate the number of beds required by the several federal hospital services; to insurance joint planning in the field of civilian and federal hospital construction; and to determine the need for and location of proposed new hospitals in the United States.

In summation, I would like to say that in arriving at its recommendations in the field of veterans' medical care, the American Medical Association has made an earnest effort to properly respect and have a sympathetic concern for all interests involved. Some will point out that the hospital casts of indigent veterans with non-service-connected conditions will be the taxpayer's responsibility in any event, either through the use of state or federal funds.

We believe that a careful review of the facts will prove that the wisest eventual course will dictate that responsibility for the care of veterans with disabilities having no relationship to military service should revert to the individual and to the state and local communities where it rightfully belongs.

The gradual expansion and intervention of the federal government into the affairs of local governments and individuals during the past decade has apparently confused some people as to the proper responsibilities of each. Continued federal encroachment into private affairs cannot be advocated logically and consistently by those who, at the same time, voice their opposition to socialism. It is time to reorient our thinking and to recognize the dangers which threaten the foundation of our basic philosophy before we reach the point of no return in terms of collective socialistic planning. It would be unfortunate indeed, if, in our efforts to reward patriotism, we were responsible for the creation of a system of government medicine, against the will of the majority, with its inevitable deterioration in the quality of medical care for veterans and non-veterans alike.

The American Medical Association discerns in this situation a urgent present need for a courageous stand and for the formalization of a legislative program limiting the activities of the federal government in the field of veterans' medical care. This is a most propitious time for creative legislative thinking and action in the solution of the important problems involved.

In conclusion, I would like to stress again the fact that the recommendations which we have made do not suggest any limitation or impairment of the hospitalization or medical care now available to veterans who have become handicapped as

a result of military service. We are in complete accord with that program.

I would also like to thank the Committee on my own behalf and on behalf of the American Medical Association for the opportunity to present our views and recommendations on this extremely important subject.

CLINICAL MEETING, ST. LOUIS, DEC. 1-4, 1953

Dr. Llewellyn Sale, chairman of the Local Committee on Arrangements for the Clinical Meeting of the American Medical Association in St. Louis, Dec. 1-4, 1953, announces that plans are developing rapidly and that from all indications the meeting will be an outstanding one. All scientific activities will be held in Kiel Auditorium, where there are ample facilities for the lecture program, Scientific Exhibit, Technical Exposition, motion picture program, and television. The House of Delegates will hold its sessions at the Jefferson Hotel.

Dr. Daniel L. Sexton, subchairman in charge of clinical presentations, has nearly completed the program for clinical presentations and color television. These will cover the fields of medicine, surgery, pediatrics, obstetrics and gynecology, tuberculosis and other diseases of the chest, cardiovascular diseases, arthritis, dermatology, gastrointestinal diseases, and neuropsychiatry. Arrangements for color television to be presented through the cooperation of Smith, Kline and French Laboratories, have been completed, but the showing of this program at the meeting will depend on the settlement of a jurisdictional dispute between two labor unions in the auditorium.

The Scientific Exhibit will be correlated as far as possible with the clinical presentations. Besides a group of 75 or 80 exhibits on the above subjects, there will be several special features. The special exhibit on fractures will be shown as usual under the fracture exhibit committee, composed of Dr. Gordon M. Morrison, Boston, chairman; Dr. Ralph G. Carothers, Cincinnati, and Dr. Herbert Virgin Jr., Miami, Fla.

A contemplated feature is an exhibit symposium on the prevention of traffic accidents. This would include the responsibility of the physician in telling his patient when he should not drive and what other precautions he should take in special situations, the testing of the drinking driver, precautions to be taken by automobile manufacturers in the reduction of hazards, and the care of the injured after an accident. Cooperation of the various agencies interested in the problem will be discussed, such as the National Safety Council, the traffic division of the police, and the various medical groups that have been attempting to solve this problem.

Medical motion pictures will be shown continuously, with the authors present, whenever possible, to discuss their work. The Committee on Medical Motion Pictures is arranging the program. The Council on Scientific Assembly is in charge of the clinical presentations and color television, while the Committee on Scientific Exhibit is in charge of the scientific exhibit and motion pictures. Applications for space in the Scientific Exhibit may be obtained from the Director, Scientific Exhibit, American Medical Association, 535 N. Dearborn St., Chicago 10, Ill.

IMPOSTOR SOUGHT

Information is urgently needed concerning the whereabouts of an alleged physician who uses the name Dr. Samuel Pike Hall. Anyone knowing his present whereabouts should contact by wire Mr. Charles R. Vaughan, State's Attorney of Richland County, Olney, Ill. The man in question is described as follows: height, 5 ft. 10½ in.; weight, 180 lb.; hair, black; age, 39; eyes, brown; complexion, dark. He has a scar on the right side of his chest. He is reported to have left Olney, Ill., where he posed as a physician, abandoning his pregnant wife without support, and owing sums of money. While in Olney, he is alleged to have conducted himself as a physician in such a manner as to gain admiration from his professional associates.

THE JOURNAL published notification of this impostor on Aug. 14, 1948, page 1475. As pointed out there, this man is not to be confused with Dr. Samuel Pike Hall of Oakland, Calif., or Dr. Samuel Parks Hall Jr., of Scottsboro, Ala., both of whom are reputable physicians engaged in the practice of medicine in their respective communities.

FEDERAL MEDICAL LEGISLATION

Public Assistance

Senators Sparkman and Hill, Democrats from Alabama, propose in S. 2351 to authorize for an additional two years after September, 1954, the present rate of federal contribution to the states for assistance for dependent children and the aged, blind, and disabled. The bill is identical with S. 1933, introduced by Senator Humphrey and previously reported. This bill was referred to the Finance Committee.

Voluntary Pension Plans

Congressman Elliott (D., Ala.) introduced H. R. 6114 to permit tax deduction in calculating income tax to facilitate the creation of retirement annuities by the self-employed. This measure is identical with H. R. 10 (Jenkins) and H. R. 11 (Keogh), previously reported. This measure was referred to the Ways and Means Committee.

Retirement Benefits for Disabled

Congressman Fino (R., N. Y.) proposes in H. R. 6115 "to amend the Social Security Act to provide that (for the purpose of old-age and survivors insurance benefits) any insured individual who is totally and permanently disabled, and who has not less than twenty quarters (five years) of coverage, shall be deemed to have reached retirement age." A "totally and permanently disabled individual" is defined as "unable to engage in any substantially gainful activity by reason of any medically determinable physical or mental impairment which is permanent in nature, or . . . blind." The bill does not specify how disability would be determined, hence the Secretary of Health, Education, and Welfare under existing authority would issue regulations regarding such determinations. This bill was referred to the Ways and Means Committee.

College Scholarship Funds

Congressman Lane (D., Mass.) proposes in H. R. 6124 to establish a federal scholarship revolving loan fund, with the states contributing up to 10% of the amount advanced to its borrowers. State loans could be made only to students accepted by an educational institution. The states would furnish lists of eligible applicants to the U. S. Commissioner of Education. This measure is similar to H. R. 6079 (Boland), previously reported. Both bills were referred to the Committee on Education and Labor.

Old-Age and Survivors Insurance

A series of identical bills were introduced to broadly revise the old-age and survivors insurance system. In the House of Representatives these bills are H. R. 6128 (Perkins, D., Ky.), H. R. 6162 (Dollinger, D., N. Y.), H. R. 6163 (Fine, D., N. Y.), H. R. 6164 (Klein, D., N. Y.), H. R. 6175 (Buckley, D., N. Y.), H. R. 6180 (Rodino, D., N. J.), H. R. 6215 (Addonizio, D., N. J.), and H. R. 6229 (Metcalf, D., Mont.). These bills are identical with S. 2260, introduced by Senator Lehman of New York and 10 other Senators, and identical with 11 House bills previously reported. The major revisions (1) extend the coverage to a large group of professional and nonprofessional workers (not including physicians or dentists); (2) increase the portion of income subject to taxation; (3) increase the monthly dollar benefits; (4) increase the amount a retired person may earn from $75 to $100 per month without forfeiture of benefits; (5) provide benefits for the permanently and totally disabled; and (6) establish cash sickness benefits. These bills were referred to the Ways and Means Committee.

The summary of federal legislation was prepared by the Washington Office of the American Medical Association and the summary of state legislation by the Bureau of Legal Medicine and Legislation.

STATE MEDICAL LEGISLATION

California

Bills Enacted.—A. 1378, has become ch. 1800 of the laws of 1953. It amends the Business and Professions Code by providing that **examinations for the physician's and surgeon's certificate** may be conducted by the board under a uniform system and for that purpose the board may make such arrangements with the organizations furnishing examination material as may in its discretion be desirable. S. 1970, has become ch. 1385 of the laws of 1953. It adds to the penal code regulations for the creation within the department of justice of a **bureau of crinimal identification and investigation.**

Connecticut

Bills Enacted.—H. 407, has become public act no. 1350 of the acts of 1953. It authorizes the conducting of **postmortem examinations and autopsies** upon a written consent given by telegram and any telegram purporting to have been sent by a person authorized to give such consent shall be conclusively presumed to have been sent by such person. H. 435, has become public act no. 189 of the acts of 1953. It amends the medical practice act by, among other things, authorizing the Connecticut medical examining board, in its discretion and subject to such regulations as the board may prescribe, to issue permits to persons otherwise licensed to practice medicine in the state except that they do not meet the residence or citizenship requirements for such license or are graduates of foreign medical schools not accredited in Connecticut to serve as **interns or residents in hospitals in the state for the purpose of extending their education.**

Delaware

Bills Enacted.—H. 387, was approved July 1, 1953. It requires every physician attending or treating **epilepsy** to report such cases to the department of motor vehicles. H. 392, was approved July 1, 1953. It requires every physician attending or treating a case of **bullet wounds, gunshot wounds, powder burn, or other injury arising from or caused by the discharge of a gun, pistol, or other firearm,** or whenever such case is treated in a hospital, sanitarium, or other institution, the manager, superintendent, or other person in charge shall report such case at once to the police authorities.

Hawaii

Bills Enacted.—H. R. 19, was adopted March 12, 1953. It resolves that the directors of all public and private hospitals be encouraged to furnish adequate **dental facilities** at their respective hospitals so that they can promote public health and welfare for the people of the territory. H. 324, was approved April 22, 1953. It amends the law relating to **narcotic drugs** by, among other things, making it the duty of **every attending or consulting physician to report** to the board of health promptly the names of persons under treatment if it appears that such persons are habitual users of narcotic drugs.

Illinois

Bills Enacted.—H. R. 34, was adopted Feb. 17, 1953. It provides for the creation of a committee to investigate the need for and the desire to have a **state institution for narcotic addicts.** H. 988, was approved June 30, 1953. It provides for the construction, equipment, and operation of a **psychiatric institute state hospital** to promote and advance knowledge through research in the causes and treatment of mental illnesses, to train competent psychiatric personnel available for service in the state hospitals and elsewhere, and to contribute to meeting the need for treatment for mentally ill patients. S. 347, was approved July 6, 1953. It is a **rabies** control act. S. 412, was approved July 1, 1953. It is a **hospital licensing law.** S. 417, was approved July 1, 1953. It amends the administrative code by authorizing the department of public health to establish and enforce **minimum standards for the operation of all general hospitals.** S. 422, was approved July 7, 1953. It amends the law relating to the practice of chiropody by **defining chiropody** as the diagnosis, medical, physical, or surgical treatment of the ailments of the human foot, with the exception of administration of general anesthetics or amputation of the foot.

Massachusetts

Bill Enacted.—H. 767, has become resolution ch. 16 of the laws of 1953. It provides for the appointment of a special commission to investigate and study relative to the care, treatment, and commitment of the **criminally insane and defective delinquents.**

Michigan

Bill Enacted.—H. R. 36, was adopted May 15, 1953. It provides for the creation of a special committee to study the laws relating to **admission to mental hospitals.**

Missouri

Bills Enacted.—H. 355, was approved July 10, 1953. It repeals existing law and enacts a new law in lieu thereof relating to the hospitalization of the **mentally ill.** S. 422, was approved June 29, 1953. It is a **hospital licensing law.**

Oklahoma

Bills Enacted.—H. 846, was approved June 3, 1953. It is a **mental health law.** S. 325, was approved June 8, 1953. It is a licensing law for the regulation of **rest homes, nursing homes** and related institutions.

Pennsylvania

Bills Introduced.—H. 1562, to amend the vital statistics law, proposes to authorize the execution of the **medical certification on the death certificate by a chiropractor** who attended the deceased during his last illness. H. 1606, to amend the law relating to mental health, proposes that no officer or employee of the department of mental health, including hospital personnel, shall be held liable personally for his official conduct of the care of a patient in any action commenced by or on behalf of such patient alleging **malpractice, libel, or negligence,** unless such action sets forth facts showing conduct (1) beyond the scope and powers of such officer or employee under this act or (2) less than or beyond the usual or customary practice of caring for a patient of such type at the time of the conduct complained of. S. 757, proposes to make it a misdemeanor to fraudulently obtain **gamma globulin** from the department of health or any of its agents.

Texas

Bills Enacted.—H. 71, was approved June 8, 1953. It amends the **narcotic drug act** by, among other things, **providing penalties for sales to minors,** by adding amidone and isonipecaine and every substance neither chemically or physically distinguishable from them together with drugs found to be addiction-forming or addiction-sustaining in a manner similar to opium or cocaine to the list of narcotic drugs and by defining a licensed physician as a person duly licensed by the Texas board of medical examiners. H. 254, was approved June 13, 1953. It amends the medical practice act by, among other things, providing a penalty for failure of a licentiate to pay his **annual registration fee** whether such licentiate practices within the border of the state or not. H. 353, was approved June 8, 1953. It provides certain amendments to the **naturopathic practice act** by, among other things, terminating the grandfather clause contained in the 1949 law. H. 415, was approved May 27, 1953. It provides that consent for licensed physician to **conduct an autopsy on the body of a deceased** person shall be deemed sufficient when given by the following: in the case of a married person, the surviving spouse or if no surviving spouse by a child of such marriage, or in the event of a minor child of such marriage by the guardian, or in the absence of such guardian by the court having jurisdiction of the minor. If the deceased be unmarried it shall be given by the following: father, mother, guardian or next-of-kin or in the absence of any of the foregoing by any natural person assuming custody of and responsibility for burial, of the body. H. 559, was approved June 9, 1953. It provides for the creation of a **commission on alcoholism** to carry on a continuing study of the problems surrounding alcoholism in the state, to establish cooperative relationships with state agencies, hospitals, clinics, etc., to promote or conduct educational programs on alcoholism, to establish local alcohol clinics, etc. S. 303, was approved June 4, 1953. It provides for the creation of **county-wide hospital districts** in certain counties.

Wisconsin

Bills Enacted.—A. 238, has become ch. 411 of the laws of 1953. It provides for the issuance of licenses to practice **physical therapy** by the board of medical examiners and defines the practice of physical therapy as the treatment of disease by the use of physical, chemical and other properties of heat, cold, light, water, electricity, massage, and therapeutic exercises including posture and rehabilitation procedures, but the use of roentgen rays and radium for any purpose and the use of electricity for surgical purposes including cauterization are not included in the practice of physical therapy. The only persons who are permitted to use the term "Physical Therapist" or the initials "P. T." or similar initials indicating that they are physical therapists are those who have been issued a license by the board of medical examiners or those who are practicing under a prescription and the direct supervision of a person licensed to practice medicine and surgery. The law does not prohibit any person licensed or registered in this state under another law from engaging in the practice for which he is licensed or registered. A. 334, has become ch. 391 of the laws of 1953. It amends the law relating to **dangerous drugs** by providing that an oral prescription by telephone or otherwise for a dangerous drug shall promptly be reduced to writing and filed by the pharmacist. S. 133, has become ch. 459 of the laws of 1953. It amends the law relating to **expert testimony** by providing that no person without a license or certificate of registration from the state board of medical examiners shall have the right to testify in a professional capacity on a subject relating to medical treatment as a medical or osteopathic physician or practitioner of any other form or system of treating the sick, providing that a medical or osteopathic physician licensed to practice in another state may testify as the attending or examining physician or surgeon to the care, treatment, examination, or condition of sick or injured persons whom he has treated in the ordinary course of his professional practice for the sickness or injury which is the subject of the judicial inquiry in any action or proceeding in which he is called as a witness. Nonresident witnesses, however, shall not be permitted to testify as attending or examining physician or surgeon or as expert witness on a medical subject unless the party calling such witness has served on the opposing party a five day written notice in advance of calling such witness to testify stating the name of such witness, his residence, and business address. S. 160, has become ch. 342 of the laws of 1953. It amends the **medical practice act** by, among other things, eliminating the list of subjects in which applicants must be examined and substituting therefor the requirement that applicants must be examined in "medicine and surgery"; and also by adding to the definition of immoral or unprofessional conduct "engaging in conduct unbecoming a person licensed to practice or detrimental to the best interests of the public." S. 161, has become ch. 405 of the laws of 1953. It authorizes the board of **basic science examiners** to accept either in whole or in part the certificate of the national board of medical examiners provided that certification by the national board is accepted by the state board of medical examiners in whole or in part and has been accepted by the basic science boards of at least six other states.

MEDICAL NEWS

ARKANSAS

Medical Fund Named for Dr. Norwood.—In recognition of service rendered the Arkansas Medical Society by Dr. Merrieman L. Norwood of Lockesburg, a fund to provide for the study of medicine by state boys and girls will be known as the Norwood Fund. Dr. Norwood originated the plan to provide funds for medical study to state high school graduates needing financial assistance, who agree to return, after graduation, to some town of less than 2,000 population and remain five years.

CALIFORNIA

Dr. Goodhart Appointed Dean.—Dr. Gordon E. Goodhart, Los Angeles, who has been on the faculty of the University of Southern California School of Medicine for five years, has been named to succeed Dr. Burrell O. Raulston, dean for 10 years and on the faculty since 1929, who will become dean emeritus. Dr. Raulston was given an honorary degree of doctor of science by Southern California at its 70th annual commencement exercises June 13 "in recognition of distinguished service in the field of medicine." Dr. Goodhart was formerly director of medical extension education for the school and for the past year served as associate dean. He became affiliated with the Los Angeles County Hospital as a resident physician after World War II service as a captain in the Army Medical Corps in Europe, and became chief of the outpatient service for the County Hospital in 1948 and coordinator of its resident training program the next year.

Personal.—Dr. Ernest H. Falconer, clinical professor of medicine, University of California Medical School, San Francisco, and since 1921 chief of the blood clinic, University of California Hospital, was recently honored by his alma mater, McGill University, Montreal, Canada, which bestowed on him the degree of doctor of laws.——Dr. Richard Thomas Barton, instructor in surgery, University of Southern California School of Medicine, Los Angeles, addressed the Fifth International Congress of Otolaryngology on June 12 in Amsterdam, Netherlands. He spoke on neoplasms involving the carotid artery. ——Dr. Bertram V. A. Low-Beer, professor of radiology in the University of California Medical School, Berkeley-San Francisco, recently delivered a paper on "The Internal and External Use of Radiophosphorus" at the Seventh International Congress of Radiology in Copenhagen, Denmark.——Dr. Milton V. Veldee, Los Angeles, is serving as a consultant to the Stanford Research Institute of Palo Alto and to the Michael Reese Research Foundation of Chicago. Dr. Veldee, formerly a medical director in the U. S. Public Health Service and chief of the Laboratory of Biologics Control, has resigned as vice-president and medical director of the Hyland Laboratories of Los Angeles.

CONNECTICUT

Who Pays the Hospital?—A study recently completed by the Connecticut Hospital Association, including analysis of cases and patient days in the 34 general hospitals in the state for the 12 months ended Sept. 30, 1952, shows that only 15% of patient days in Connecticut's community hospitals were paid for by the patients. Connecticut Hospital Service (Blue Cross) absorbed the costs of 50% of cases and 45.5% of patient days. Commercial insurance carriers paid 24.5% of total hospital charges in both categories, and city and town welfare budgets were called on to meet costs for only 1.5% of cases and 2.5% of patient days.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

ILLINOIS

Unauthorized Cancer Fund Solicitations.—The Illinois Division of the American Cancer Society announces that it has not authorized use of its name in connection with a newspaper subscription campaign raising funds for "cancer." Professional solicitors, who promise a contribution to a "cancer fund" in return for a newspaper subscription, have been calling Chicago and suburban residents to say that the "cancer drive" has failed to reach its goal. On the contrary, the division reports, the Cancer Crusade has actually exceeded its goal and has ended as one of the most successful in history.

Chicago

Dr. Manlove Goes to Colorado.—Dr. Francis R. Manlove, associate secretary of the A. M. A. Council on Medical Education and Hospitals, has been appointed director of the University of Colorado Medical Center in Denver, dean of the department of medicine, and professor of medicine, to succeed Dr. Ward Darley, who became president of the university July 1. Until Dr. Manlove takes up his new duties shortly after Oct. 15, Dr. Robert C. Lewis, dean of the medical school, will continue as acting director of the medical center. Dr. Manlove was previously affiliated with the Mayo Foundation for Medical Education and Research, the Mayo Clinic, Rochester, Minn., and Temple University School of Medicine in Philadelphia. He is an adviser to the director of the Selective Service System and a member of several national committees on medical education.

University News.—Dr. Tibor Benedek has been appointed assistant professor of dermatology in Stritch School of Medicine of Loyola University. During World War II he was chief of the dermatological service at Fletcher General Hospital, Cambridge, Ohio, and later at the 233rd General Hospital in the Asiatic Pacific Theater.——The following appointments to the faculty of the Chicago Medical School have been announced: Dr. Irving J. Shapiro, associate professor of urology; Dr. Herman M. Soloway, associate professor of clinical genitourinary surgery; Dr. Louis Edidin, assistant professor of clinical medicine; Dr. William F. Lichtman, assistant in orthopedic surgery; Dr. Marvin Padorr, assistant in pediatrics; and Dr. Samuel Nien-Tsu Wong, instructor in surgery.——At the commencement exercises of the Chicago professional colleges of the University of Illinois, June 18, emeritus status was awarded to the following faculty members who will retire Sept. 1: Dr. Thomas Cottrell, clinical assistant professor of urology; Dr. Michael H. Ebert, clinical professor of dermatology; Drs. Georgiana Theobald and Earle B. Fowler, clinical associate professors of ophthalmology; and Dr. Sidney A. Portis, who recently resigned as clinical associate professor of medicine to enter private practice in California.

IOWA

Dr. Steindler Honored.—Dr. Arthur Steindler, head of the department of orthopedics at Mercy Hospital, Iowa City, has been made an honorary member of the British Orthopedic Association "on the basis of his outstanding contributions to orthopedic surgery in regard to the basic studies of orthopedic problems and for his major contributions of many orthopedic textbooks and articles and in particular for his outstanding efforts in training and teaching." For more than 30 years Dr. Steindler served as head of the orthopedic department of the State University of Iowa College of Medicine in Iowa City.

KANSAS

Dr. Jury Honored.—Dr. Herbert W. Jury, who at the age of 78 is still practicing after 50 years of service, was recently feted by more than 2,000 residents of Claflin and surrounding communities. Members of the Methodist WSCS, Lutheran Ladies'

Aid, Southern Baptist Women, and the Altar Society of the Immaculate Conception Catholic Church collected 50 silver dollars, which were hung from a gold-trimmed money tree, which they presented to Dr. Jury. He had previously been honored by the Claflin Lions Club and by the physicians of Hoisington, Ellinwood, and Great Bend.

MARYLAND

Dr. Reed Retires as Hopkins Vice-President.—Lowell J. Reed, Ph.D., vice-president of the Johns Hopkins University and Hospital and since 1949 administrative head and coordinator of all Hopkins medical activities, retired as of June 30 after 35 years as a member of the faculty and administrator. The responsibilities formerly discharged by Dr. Reed as vice-president have been assigned to the medical planning and development committee, consisting of the deans of the schools of medicine and of hygiene and public health and the director of Johns Hopkins Hospital. Dr. Reed, who has been appointed professor emeritus of biostatistics, will assist the Johns Hopkins institutions in bringing to fruition certain long-range plans, in the formulation of which he has played an important part. Dr. Reed, together with the late Raymond Pearl, Ph.D., whom he succeeded as professor of biostatistics in 1925, wrote the mathematical formula for the logistic curve as related to the growth of populations, which led to the development of epidemic theory, an explanation of the varying cycles of contagious disease in a community. Dr. Reed was a member of the President's Commission on the State of the Nation's Health and since the outbreak of World War II has been consultant on Manpower and Medical Statistics to the surgeons general of the Army, Navy, and Air Force, U. S. Public Health Service and Selective Service, U. S. State Department, National Research Council, the Veterans Administration, and a member of the National Advisory Health Council. For many years he has been a consultant and member of scientific boards of the Rockefeller Foundation, the Commonwealth Fund, and the Milbank Memorial Fund. In 1943 he was chairman of the United States delegation to the Inter-American Demographic Conference in Mexico City; in 1947 he headed the U. S. Committee on Joint Causes of Death, which won the Lasker Award in Public Health for its work on the International List on Morbidity and Mortality; and in 1948 he was named chairman of the Surgeon General's Committee on Medical School Grants and Finances. Dr. Reed was dean and director of the Johns Hopkins School of Hygiene and Public Health from 1937 to 1946, when he was appointed vice-president of the university in charge of medical activities. In 1949 he was named vice-president of the hospital, the first such dual appointment in the history of the university.

MASSACHUSETTS

Dr. Paul Patterson Goes to Albany.—Dr. Paul R. Patterson, instructor in pediatrics, Harvard Medical School, Boston, has been appointed professor of pediatrics, Albany (N. Y.) Medical College, and pediatrician-in-chief to the Albany Hospital. Dr. Patterson, who has been affiliated with the Kansas City (Mo.) General Hospital, the Research and Educational Hospitals of the University of Illinois, and the University of Illinois College of Medicine, Chicago, has served as director of the diagnostic laboratory at the Children's Medical Center, Boston.

Society News.—At the annual dinner-meeting of the Massachusetts Society of Examining Physicians at the Harvard Club in Boston, the following officers were elected: president, Dr. Charles H. Bradford, Boston, president-elect, Dr. Carl Bearse, Boston, vice-president, Dr. Ronald W. Adams, Boston, treasurer, Dr. Robert C. Gwin, Brookline, and secretary, Dr. J. Robertson Knowles, Boston.——At its annual meeting in Boston the Massachusetts Medical Society elected Dr. Frederic Hagler, Springfield, president, Dr. Curtis C. Tripp, New Bedford, president-elect, and Dr. Harvey A. Kelley, Winthrop, vice-president. Dr. Robert W. Buck, Boston, who was serving as secretary pro tem, was made secretary, and Dr. Eliot Hubbard Jr., Cambridge, was reelected treasurer.

MICHIGAN

Dr. De Jongh Wins Industrial Award.—At its recent convention in Los Angeles the Industrial Medical Association named Dr. Edwin De Jongh, medical director of the Detroit Diesel Engine Division of General Motors, as winner of the meritorious service award. Dr. De Jongh, who designed a surgical tray to be used in emergencies, was honored "for making the greatest contribution to the association."

Dr. Burley Week.—"In recognition of the splendid service to the community and the untiring efforts on behalf of its citizens and for the 60 years of service to humanity," the village president of Almont proclaimed a "Dr. Burley Week," in which the community honored Dr. David H. Burley, 89, a life member of the Michigan State Medical Society. The week of recognition started with a special service at the First Congregational Church on Sunday and ended with a potluck picnic at the school grounds on Friday, when the community's gift, a fund to help establish a 50 bed hospital, was announced.

MINNESOTA

Wangensteen Surgical Foundation Established.—The Owen H. Wangensteen Surgical Education Foundation has been established at the University of Minnesota, Minneapolis, to promote advanced surgical education. Initial funds were donated by Dr. F. John Lewis, associate professor of surgery, Dr. Richard L. Varco, professor of surgery, and Dr. Charles E. Rea, clinical associate professor of surgery. Dr. Wangensteen will act as an adviser in administration of the funds.

Personal.—Drs. William C. Mussey and Joseph B. Seagle, recently attached to the Mayo Clinic staff at Rochester, Minn., have joined the staff of Carle Memorial Hospital in Urbana, Ill. ——On a recent visit to Santiago, Chile, Dr. Thomas B. Magath of Rochester was made an honorary member of the Medical Faculty of the University of Chile in recognition of his contributions to the field of parasitology.——Dr. Donald C. Balfour, professor of surgery, University of Minnesota Graduate School, Rochester, has been elected foreign correspondent in the second division (surgery, obstetrics, and surgical specialties) by the National Academy of Medicine of France.

NEW JERSEY

Dr. Eckardt Accepts University Appointment.—Dr. Robert E. Eckardt, Linden, has been appointed an associate clinical professor of industrial medicine at the New York University College of Medicine. Dr. Eckardt is director of the medical research division of the Standard Oil Development Company.

Dr. Murn Honored.—Dr. Charles J. Murn, Paterson, a past president of the Passaic County Medical Society, was honored by Fordham University, New York, in a ceremony that paid tribute to its three oldest graduates. Dr. Murn, who graduated in the class of 1903 and has served as Paterson's health commissioner, jury commissioner, and as president of St. Joseph Hospital for many years, was congratulated by Cardinal Spellman on his years of achievement and service.

Cancer Fellowships.—The New Jersey State Department of Health announces several fellowships for residency training in oncology. Each fellowship, for one full year of training, will be granted in general oncology or in one of the special aspects of this subject; stipend is $3,600 per year. Applicants must be citizens of the United States, licensed to practice in the state of New Jersey or eligible for licensure, and must have been accepted by one of the participating institutions: Elizabeth General Hospital and Dispensary and James S. Green Memorial Tumor Clinic, Elizabeth; Memorial Center for Cancer and Allied Diseases, New York; American Oncologic Hospital and Jeanes Hospital, Philadelphia. Information and application forms may be obtained from the New Jersey State Department of Health, Bureau of Cancer Control, 65 Prospect St., Trenton.

NEW YORK

Trudeau Meeting.—The Trudeau School of Tuberculosis announces that at its recent four week course at Trudeau Sanatorium and Saranac Lake, the best attended in its 39 year history, physicians came from 11 states and 12 foreign countries: Pakistan, Thailand, Canada, Japan, China, Germany, Paraguay, India, Brazil, the Philippines, El Salvador, and Turkey. They included public health officers, staff physicians of hospitals and clinics, instructors, and physicians from the armed services.

Dr. Ingraham Named First Deputy.—Dr. Hollis S. Ingraham, Albany, who has been affiliated with the state department of health since 1934 and has served as a deputy commissioner since Aug. 1, 1948, has been appointed first deputy health commissioner, succeeding Dr. William A. Brumfield, who resigned to become professor of public health and preventive medicine at the State University of New York College of Medicine at Syracuse. Dr. Ingraham, who served during World War II as a lieutenant commander in the Navy, also saw overseas service with the U. S. Typhus Commission at Cairo, Egypt.

New York City

Increased Incidence of Tuberculosis.—According to the annual report of the New York Tuberculosis and Health Association, although the death rate from tuberculosis shows a marked decline, the incidence of new tuberculosis cases in New York City continues to rise. In the first three months of 1953, as compared with same period in 1952, new cases throughout the city increased 5% and were discovered in an advanced stage, making the cure longer and more expensive. There are presently 18,319 cases of active tuberculosis in the five boroughs. As of March 31, only half of Manhattan's 8,391 tuberculosis patients were receiving hospital care.

March of Dimes Grants.—Grants totaling $47,994 were recently received by the New York University-Bellevue Medical Center from the National Foundation for Infantile Paralysis. A grant of $15,594 will enable medical center scientists, under the direction of Mark H. Adams, Ph.D., associate professor of microbiology at New York University College of Medicine, to continue their fundamental studies and obtain further knowledge of the nutritional requirements of viruses as they multiply at the expense of the host cells. Dr. Adams' group, which previously demonstrated that certain bacterial viruses will not multiply in host cells unless fairly high concentrations of calcium are present, will now study the effect on virus multiplication of varying calcium concentrations in an effort to pinpoint the calcium dependent stage. They will also study the problem of developing mutant or hybrid virus types by reshuffling the genes that control inherited characteristics. Under the direction of Dr. Currier McEwen, dean of New York University College of Medicine, and Dr. Howard A. Rusk, chairman of the department of physical medicine and rehabilitation, $9,720 will be used toward teaching the basic concept and techniques of medical rehabilitation to medical students. An additional grant in the amount of $22,680 will enable New York University College of Medicine to expand a specialized training program in physical medicine and rehabilitation, for better care of patients handicapped by poliomyelitis and other crippling diseases.

NORTH CAROLINA

Society News.—At its annual meeting in Pinehurst the Medical Society of the State of North Carolina elected the following officers: president, Dr. Joseph A. Elliott Sr., Charlotte; president-elect, Dr. Zack D. Owens, Elizabeth City; vice-presidents, Drs. John F. Foster, Sanford, and Julian A. Moore, Asheville. Dr. Millard D. Hill, Raleigh, continues as constitutional secretary and Mr. James T. Barnes, Raleigh, as executive secretary.

Dr. Forbus Goes to Formosa.—Dr. Wiley D. Forbus, chairman of the pathology department, Duke University School of Medicine, Durham, has been granted a leave of absence to accept a six month assignment as a Mutual Security Agency consultant in Formosa. His primary task will be to assist in the rehabilitation of the National Taiwan University Medical School, Taipeh, Taiwan. This program will include setting up teaching residencies and residency training programs, as well as establishing diagnostic laboratories in the hospital and medical school and planning the school's curriculum.

OHIO

Memorial to Classmate.—The seniors of the University of Cincinnati College of Medicine honored the memory of one of their classmates, Herbert N. Schiff, who was killed in an automobile accident during his sophomore year, by electing his father, Dr. Leon Schiff, an honorary member of the class. Dr. Schiff is associate professor of medicine in the college of medicine. About $10,000 has already been contributed to the Herbert N. Schiff memorial fund in the college of medicine.

Dr. Brower Receives Award.—Dr. Alonzo B. Brower, Dayton, was recently given the Alfred Stengel memorial award by the American College of Physicians. The award is made periodically to a fellow of the college "who, by virtue of his loyalty and service to the college, deserves an honor from it that is unique" and who has had "an outstanding influence in maintaining and advancing the best standard in medical education, medical practice and clinical research." In 1950, Dr. Brower established an endowment trust that provides an opportunity for worthy young physicians to go as visiting fellows to some institution for the purposes of observation and postgraduate study. Dr. Brower has been a member of the staff of St. Elizabeth Hospital and a director of the medical staff of Miami Valley Hospital for many years. He is a past president of the Montgomery County Medical Society.

PENNSYLVANIA

Dewees Public Health Scholarship.—The Pennsylvania Tuberculosis and Health Society announces the establishment of the Arthur Markley Dewees scholarship for advanced study of public health in recognition of the services of Dr. Dewees as executive secretary of the society from 1919 to 1952. The scholarship (stipend $2,000) is to be awarded annually to a Pennsylvanian for one year's graduate study in an accredited school of public health leading to a masters degree or in any recognized graduate school offering a curriculum designed to prepare a student for administrative or other professional service in tuberculosis or public health work.

Philadelphia

Personal.—A portrait of Dr. Charles M. Gruber, professor of pharmacology at Jefferson Medical College, Philadelphia, was recently presented to the college by the senior class.——Dr. Harold A. Taggart, assistant dean of Hahnemann Medical College and Hospital of Philadelphia, is serving as acting medical director of Hahnemann Hospital until a permanent appointment is made to fill the vacancy created when Dr. Charles E. Price left to become medical director of the General Hospital of Fresno County, Fresno, Calif.

Dr. Appel Heads Psychiatric Department.—Dr. Kenneth E. Appel, professor of psychiatry, University of Pennsylvania School of Medicine, was recently appointed as chairman of the department, succeeding Dr. Edward A. Strecker, who has been professor of psychiatry since 1931 and now becomes emeritus professor of psychiatry. Dr. Appel, who is also director of the Functional Diseases Service of the University of Pennsylvania Hospital, has been affiliated with the university since 1924. He was named president-elect of the American Psychiatric Association at the annual meeting in Los Angeles, and is president of the Marriage Council of Philadelphia, which recently became affiliated with the School of Medicine of the University of Pennsylvania. Dr. Strecker will continue as a member of the faculty of the graduate school of medicine and as chief of service and consultants at the Institute for Mental Hygiene, which is affiliated with the Pennsylvania Hospital.

SOUTH CAROLINA

Orthopedic School Group.—The following physicians of Charleston have volunteered to serve on the medical advisory committee for the new Easter Seal Orthopedic School: Joseph I. Waring, B. Owen Ravenel, Bachman S. Smith, John A. Siegling, and James J. Cleckley. They will screen all applications and make final decisions on enrollment in the school. Children attending the Easter Seal Orthopedic School will receive physical, occupational, and speech therapy, if necessary, in addition to special education.

TENNESSEE

Society News.—The Tennessee Diabetes Association has elected the following officers: president, Dr. Daniel R. Thomas, Knoxville, vice-president, Dr. Robert F. Ackerman, Memphis, and secretary-treasurer, Dr. Jean M. Hawkes, Memphis.——At its recent semiannual meeting the Middle Tennessee Medical Association elected Dr. Taylor Farrar, Shelbyville, president, Dr. S. Ogle Jones, Centerville, president-elect, and Dr. Frank G. Witherspoon, Nashville, secretary-treasurer. The next semiannual meeting of the association will be held in Murfreesboro on Nov. 19.——Officers of the newly formed Tennessee Heart Association include Dr. Benjamin F. Byrd Sr., Nashville, president, Dr. Philip H. Livingston, Chattanooga, vice-president, John W. Apperson, Memphis, secretary, and Laurie F. Pratt, Knoxville, treasurer. The state office of the association is in Nashville.

Personal.—Dr. Robert H. Hutcheson, Franklin, has been reappointed state health commissioner, a position that he had held since 1943 under three previous administrations. Dr. Hutcheson has served as a member of the A. M. A. House of Delegates and president of the State and Territorial Health Officers' Association, and has been assistant professor of medicine at Vanderbilt University School of Medicine, Nashville.——Dr. James A. Taylor, senior psychiatrist at VA Hospital (Kennedy), Memphis, has been appointed assistant professor of psychiatry and neurology and clinical director at the Gailor Memorial Psychiatric Hospital, Memphis. Dr. Taylor was previously affiliated with Kings Park State Hospital, Kings Park, N. Y.——Dr. Cyril J. Ruilmann, who has directed Gailor Memorial Psychiatric Hospital for the last 10 years, has been chosen by Governor Clement to head the new Tennessee Department of Mental Health.——During the week of April 12 Dr. R. Eustace Semmes, University of Tennessee College of Medicine, Memphis, occupied the George A. Ball Visiting Professorship in Surgery, recently inaugurated at the Indiana University School of Medicine, Indianapolis, by the James Whitcomb Riley Memorial Association.——Dr. Robert C. Little, associate professor of physiology at the University of Tennessee Medical Units, Memphis, has been appointed associate professor of medicine in the division of internal medicine. Dr. Little, author of numerous publications in cardiovascular research, will continue his investigations in this field, in addition to his teaching duties.——A portrait of Dr. F. Thomas Mitchell, chief, division of pediatrics, University of Tennessee College of Medicine, Memphis, was presented to the university June 11. The portrait is the gift of Memphis pediatricians. Dr. Mitchell has been on the staff of the College of Medicine since 1917.

TEXAS

Dr. Hertell Named for Red Cross Post.—Dr. Joseph Alan Hertell, who has served for 13 months as director and administrator of the Central Texas Red Cross regional blood center at Waco, has been appointed assistant director of the national Red Cross blood program.

Alumni Honor Dr. Moursund.—Honoring Dr. Walter H. Moursund Sr., retiring dean, the annual banquet of the Baylor University College of Medicine Alumni, recently held in Houston, was attended by more than 600 persons. Dr. Cecil F. Jorns, Houston, president of the Alumni Association, presided. An engraved watch was presented to Dr. Moursund. Officers elected were Dr. Richard H. Harrison Jr., Bryan, president-elect; Drs. Robert G. McCorkle Sr., San Antonio, and Hannibal L. Jaworski, Waco, vice-presidents; and Dr. John C. Haley, Houston, secretary-treasurer.

VERMONT

Biggs Award to Dr. Wadsworth.—Dr. Augustus B. Wadsworth, Manchester, director of the division of laboratories and research, New York State Department of Health, 1914-1945, is the recipient of the Hermann M. Biggs memorial award by the New York State Public Health Association. The citation described Dr. Wadsworth as "founder of the public health laboratory system of New York State, which today is outstanding in the world; developer of recognized standards for laboratory techniques in sanitation and in the diagnosis of infectious diseases; an outstanding investigator in the field of infection, and in the assay of therapeutic antisera; a pioneer in the study of endocarditis following pneumococcus infection; a leader in the development of the quantitative complement fixation test for the serodiagnosis of syphilis and other infectious diseases . . ."

VIRGINIA

Governor Appoints Tuberculosis Control Committee.—Gov. John S. Battle has appointed the following physicians on a committee "to serve in an advisory capacity to the State Board of Health and to make recommendations and suggestions as it deems appropriate" in the fight to eradicate tuberculosis: John T. T. Hundley, Lynchburg; Andrew D. Hart and Everett C. Drash, Charlottesville; Felix J. Brown and Edward S. Ray, Richmond; Frank R. Trigg and Samuel E. Hughes Jr., Norfolk; George W. Oast, Portsmouth; Lemuel R. Broome, Danville; and James N. Dudley, Roanoke.

Society News.—The Virginia Surgical Society, recently organized at a luncheon meeting at the Richmond Academy of Medicine Building, elected the following officers: president, Dr. Randolph H. Hoge, Richmond; vice-president, Dr. Hugh H. Trout Jr., Roanoke; secretary, Dr. Robert L. Payne Jr., Norfolk; and treasurer, Dr. William R. Hill, Richmond. Elected to the council were Drs. Edwin P. Lehman, Charlottesville; Isaac A. Bigger, Richmond; Edmund Horgan, Winchester; and Richard P. Bell Jr., Staunton. The next meeting of the society will be held during the annual meeting of the Medical Society of Virginia at Roanoke, Oct. 18-21.

WEST VIRGINIA

University News.—Daniel Thomas Watts, Ph.D., Charlottesville, associate professor of pharmacology at the University of Virginia School of Medicine since 1949, has accepted appointment as professor and head of the department of pharmacology at West Virginia University School of Medicine, Morgantown. Dr. Watts, who served in the U. S. Naval Reserve as an ensign until 1947 and was released with the rank of lieutenant commander, taught and conducted research in aviation physiology.

Meeting on Infectious Diseases.—A program on infectious diseases, sponsored by Lederle Laboratories, will be presented by the West Virginia Academy of General Practice at the Hotel Fairmont in Fairmont, Aug. 16. Subjects to be discussed include rabies, poliomyelitis, infectious hepatitis, genitourinary infections, atypical pneumonia, infectious pneumonia, infectious mononucleosis, and histoplasmosis. The morning session, which will begin at 10 o'clock, will be followed by a luncheon at the Hotel Fairmont, with Lederle Laboratories as host. Panel discussions will follow both the morning and the afternoon programs. All members of the medical profession in West Virginia are invited to attend the meeting.

WYOMING

State Medical Election.—At the annual meeting the Wyoming State Medical Society installed Dr. James W. Sampson, Sheridan, as president and elected Dr. Bernard J. Sullivan, Laramie, president-elect, Dr. Nels A. Vicklund, Thermopolis, vice-president, Dr. Royce D. Tebbet, Casper, secretary, and Dr. Curtis L. Rogers, Sheridan, treasurer. The annual session of 1954 will be held during the first week in June in Sheridan.

GENERAL

Visiting Scientists.—Dr. H. E. Holling of the Medical Research Council's Clinical Research Unit at Guy's Hospital, London, England, is spending some time in the United States at the invitation of the University of Pennsylvania School of Medicine, Philadelphia. He will also make a few visits on behalf of the Medical Research Council, including attendance at the International Physiology Congress in Montreal. Address: U. K. Scientific Mission, 1800 K St., N.W., Washington, D. C.—— Dr. A. D. Macrae, Public Health Laboratory Service (directed by the Medical Research Council on behalf of the Ministry of Health, United Kingdom), is completing a year at Yale University under a Smith-Mundt award supplemented by assistance from the Yale authorities.

Diathermy Machines for Korea.—Pointing out that a Federal Communications Commission ruling has outlawed use in the United States of thousands of short-wave diathermy machines whose frequencies interfere with radio and television programs as well as with police and defense communication channels, Dr. Howard A. Rusk, director of the Institute for Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center, advises that these machines are needed for treatment of crippled and sick persons in Korea. Most of the machines built before 1947 will have to be scrapped. Dr. Rusk, who is medical adviser to the American-Korean Foundation (303 Lexington Ave., New York 16), which is currently conducting a campaign for 5 million dollars to provide emergency relief for Korea, states that the foundation has received requests for more than 25 machines. Three, a gift from the physicians' supply firm of Cole, Dominick and Rogg, Inc., will be used at a 900 bed rehabilitation center that the foundation is helping to set up and staff at Tongnae in Korea. Requests for diathermy equipment have also been received from the Severance Hospital and Maryknoll Sisters Clinic in Pusan.

Congress on Electroencephalography.—The International Congress of Electroencephalography and Clinical Neurophysiology will be held at Agassiz House, Radcliffe College, Cambridge, Mass., Aug. 16-21. The presidential address will be delivered at 1:30 p. m. by Dr. Alexander Forbes, Boston. Symposiums to be presented in the Agassiz House auditorium include: "Recent Developments in Electroencephalographic Techniques," "Physiological Basis of the Electroencephalogram," "Interpretation of the Electroencephalogram," "Evaluation of Activation of the Electroencephalogram," "Interrelationships Between Cortex and Subcortical Structures," and "Characteristics and Significance of Seizure Discharges," in collaboration with the American League Against Epilepsy. Tuesday evening will be devoted to cinematographic presentations. After the morning session on Wednesday the day has been reserved for a social afternoon and evening, which will include a shore party at Crane Beach and Bird Sanctuary at Ipswich. The informal dinner at the Hotel Continental Friday, 8 p. m., will be preceded by a cocktail party in the gardens of the hotel for foreign members and their wives, who will be guests of the American League Against Epilepsy.

Gerontologists Meet in San Francisco.—The annual scientific meeting of the Gerontological Society, Inc., will be held at the Hotel Mark Hopkins, San Francisco, Aug. 25-27. The general session will open Tuesday, 9:30 a. m., in the Room of the Dons with presentation of "New Roles for the Aging," "Gerontological Implications in Pharmacology," "Mental Health and Aging," "Biochemical Aspects of Aging," and "Education for Aging." The sessions will end with a symposium on arteriosclerosis Thursday, 3:15 p. m., in the Golden Empire Room, when Albert I. Lansing, Ph.D., St. Louis, will serve as chairman for the following panel: Dr. James F. Rinehart, San Francisco, Dr. Charles A. Woerner, Louisville, Dr. Silas M. Evans, Milwaukee, and Henry S. Simms, Ph.D., New York. The San Francisco Regional Office of the U. S. Department of Health, Education and Welfare has arranged a program on motion pictures on aging for Tuesday evening in the Room of the Dons, with Dr. Henry C. Schumacher, San Francisco, regional mental health consultant, Public Health Service, as discussant. Cocktails, Thursday, 6 p. m., will precede the annual dinner in Peacock Court, which will be addressed by Dr. Emund V. Cowdry, St. Louis, president, and Dr. J. H. Sheldon, Royal Hospital, Wolverhampton, England. The National Committee on Aging of the National Social Welfare Assembly will hold an all day meeting, Aug. 28, at Hotel Mark Hopkins. The luncheon meeting, "In the Vanguard of Service Programs for Older People on the West Coast," and the afternoon sessions will be open meetings. The morning will be devoted to a meeting of the West Coast Advisory Committee to the project on criteria for the continued employment of older workers and a business session on activities and plans of the National Committee on the Aging. Attendance at these meetings will be limited to members of the committee and their invited guests.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories, and possessions in the weeks ended as indicated:

Area	July 18, 1953		July 19, 1952
	Paralytic Type	Total Cases Reported	Total
New England States			
Maine	4	5	..
New Hampshire	..	5	..
Vermont	..	..	1
Massachusetts	5	14	..
Rhode Island	3	3	..
Connecticut	2	15	6
Middle Atlantic States			
New York	23	103	68
New Jersey	9	26	16
Pennsylvania	..	35	18
East North Central States			
Ohio	18	63	69
Indiana	..	23	22
Illinois	17	72	46
Michigan	17	62	56
Wisconsin	..	9	26
West North Central States			
Minnesota	22	46	27
Iowa	6	10	82
Missouri	11	42	13
North Dakota	..	1	..
South Dakota	..	4	15
Nebraska	6	14	55
Kansas	..	20	37
South Atlantic States			
Delaware	..	..	3
Maryland	20	34	7
District of Columbia	1	3	1
Virginia	27	55	17
West Virginia	5	14	22
North Carolina	23	88	14
South Carolina	3	10	1
Georgia	4	27	24
Florida	7	25	22
East South Central States			
Kentucky	6	25	73
Tennessee	14	62	24
Alabama	9	29	20
Mississippi	..	21	51
West South Central States			
Arkansas	6	19	14
Louisiana	8	23	83
Oklahoma	9	30	46
Texas	15	86	243
Mountain States			
Montana	9	11	6
Idaho	..	..	4
Wyoming	..	2	1
Colorado	..	4	10
New Mexico	..	8	19
Arizona	2	7	8
Utah	..	10	4
Nevada	..	3	..
Pacific States			
Washington	..	8	38
Oregon	2	4	19
California	33	82	59
Territories and Possessions			
Alaska	2	5	..
Hawaii	1	1	12
Puerto Rico	..	..	1
Total	349	1,262	1,403

Communicable Diseases During the First Half of 1953.—According to a report from the Department of Health, Education and Welfare, U. S. Public Health Service, comparison of communicable disease cases reported during the first half of 1953 and those reported during the like period in 1952 shows the following results:

Disease	First 26 Weeks 1953	First 26 Weeks 1952
Anthrax	20	19
Botulism	6	8
Brucellosis (undulant fever)	826	1,061
Diphtheria	1,050	1,403
Encephalitis, acute infectious	530	620
Hepatitis, infectious and serum	17,390	9,001
Malaria: civilian	234	423
military	289	2,516
Measles	388,584	622,900
Meningococcic infections	3,301	2,989
Poliomyelitis, acute	4,680	4,176
Rabies in man	3	8
Rocky Mountain spotted fever	130	131
Scarlet fever and streptococcic sore throat	95,067	72,305
Smallpox	16	13
Trichinosis	221	193
Tularemia	280	345
Typhoid	888	944
Typhus, endemic	105	86
Whooping cough	16,991	27,329
Rabies in animals	4,033	4,636

Annual Meeting of National Medical Association.—The annual meeting of the National Medical Association will be held at the Meharry Medical Center, Nashville, Tenn., Aug. 10-14, under the presidency of Dr. Whittier C. Atkinson, Coatesville, Pa. Monday morning the public health section will hold an open public meeting in the auditorium. The general sessions will open Tuesday, 9 a. m., when a panel honoring the Nashville founders of the association will be presented. The presidential address will be delivered shortly before adjournment. The medical section will hold clinicopathological conferences Tuesday, 4:30 p. m., Thursday and Friday, 11:30 a. m., and a panel discussion on blood diseases Wednesday at 4 p. m. The section on pediatrics will present a clinical panel on "Common Problems Arising in the Care of Infants and Children" Tuesday, 4 p. m. During pediatric ward rounds at the George W. Hubbard Hospital of Meharry Medical College Wednesday afternoon there will be a "Cine Lecture on Ventricular Filbrillation and Defibrillation" 2:10 p. m., and at 4:30 p. m. a fracture consultation panel. The section on surgery, urology, and orthopedics, which will share in this program, will conduct operative clinics at Vanderbilt University on Tuesday morning and at Hubbard Hospital on Thursday and Friday mornings, and will hold an open meeting in the auditorium at Meharry on Wednesday. A panel discussion on peptic ulcers will be presented at 9:40 a. m., and at 11:15 a. m. Dr. Clarence S. Greene, associate professor of surgery, Howard University College of Medicine, Washington, D. C., will deliver the Stubbs Oration in Surgery on "Astrocytomas." On Thursday, 10:30 a. m., during the open meeting in the amphitheater the radiology section will present a symposium on "Problems of the Urinary Tract with Special Reference to Radiologic Procedures." The final session of the medical section on Friday will feature a symposium on cancer at 10:30 a. m. by Drs. Jack E. White, assistant professor of surgery and director of the Cancer Detection Clinic of Freedmen's Hospital, Washington, D. C., John F. W. King, Wilmington, Del., director of surgery section, American Cancer Society, and Ralph R. Braund, coordinator of cancer, University of Tennessee College of Medicine, Memphis. Tuesday night has been reserved for the welcome night program in the Mount Olive Baptist Church, 9th and Charlotte, at which Dr. Daniel T. Rolfe, Nashville, will preside. The president's grand ball will be held Thursday at 9 p. m., and the incoming president, Dr. A. Porter Davis, Kansas City, Kan., will deliver an address immediately preceding adjournment of the general sessions Friday afternoon.

MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

1953 Clinical Session, St. Louis, Dec. 1-4.
1954 Annual Session, San Francisco, June 21-25.
1954 Clinical Session, Miami, Florida, Nov. 30-Dec. 3.
1955 Annual Session, Atlantic City, N. J., June 6-10.
1955 Clinical Session, Boston, Nov. 29-Dec. 2.

PUBLIC RELATIONS INSTITUTE, Drake Hotel, Chicago, Sept. 2-3. Mr. Leo E. Brown, 535 North Dearborn St., Chicago 10, Director.

AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS AND ABDOMINAL SURGEONS, The Homestead, Hot Springs, Va., Sept. 10-12. Dr. William F. Mengert, 2211 Oak Lawn Ave., Dallas, Texas, Secretary.

AMERICAN CONGRESS OF PHYSICAL MEDICINE, Palmer House, Chicago, Aug. 31-Sept. 4. Dr. Walter J. Zeiter, 30 North Michigan Ave., Chicago 2, Executive Director.

AMERICAN DIETETIC ASSOCIATION, Los Angeles, Aug. 24-28. Miss Ruth M. Yakel, 620 N. Michigan Ave., Chicago 11, Executive Secretary.

AMERICAN ELECTROENCEPHALOGRAPHIC SOCIETY, Commander and Continental Hotels, Cambridge, Mass., Aug. 17-22. Dr. John A. Abbott, Massachusetts General Hospital, Boston 14, Secretary.

AMERICAN HOSPITAL ASSOCIATION, San Francisco, Aug. 31-Sept. 3. Mr. George Bugbee, 18 East Division St., Chicago 11, Executive Director.

AMERICAN SOCIETY FOR PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS, Fall Meeting, Yale University, New Haven, Conn., Sept. 7-9. Dr. Carl C. Pfeiffer, 1853 West Polk St., Chicago 12, Secretary.

BIOLOGICAL PHOTOGRAPHIC ASSOCIATION, Hotel Statler, Los Angeles, Aug. 31-Sept. 3. Miss Jane H. Waters, 533 West 57th St., New York 19, Secretary.

GERONTOLOGICAL SOCIETY, Mark Hopkins Hotel, San Francisco, Aug. 25-27. Dr. Nathan W. Shock, Baltimore City Hospitals, Baltimore 24, Secretary.

MONTANA MEDICAL ASSOCIATION, Northern Hotel, Billings, Sept. 17-20. Mr. L. R. Hegland, 104 North Broadway, Billings, Executive Secretary.

NATIONAL MEDICAL ASSOCIATION, Nashville, Tenn., Aug. 10-14. Dr. John T. Givens, 1108 Church St., Norfolk 10, Va., Executive Secretary.

NORTH PACIFIC SOCIETY OF INTERNAL MEDICINE, Harrison, B. C., Sept. 18-19. Dr. Clarence C. Pearson, 1115 Terry Ave., Seattle 1, Wash., Secretary.

REGIONAL MEETINGS, AMERICAN COLLEGE OF PHYSICIANS:

NORTH DAKOTA, Fargo, Sept. 12. Dr. Robert B. Radl, 221 Fifth St., Bismarck, Governor.

ARKANSAS-OKLAHOMA, Tulsa, Okla., Sept. 19. Dr. Wann Langston, 117 North Broadway, Oklahoma City 2, Governor.

SOCIETY OF AMERICAN BACTERIOLOGISTS, Palace Hotel, San Francisco, Aug. 10-14. Dr. John H. Bailey, Sterling-Winthrop Research Institute, Rensselaer, N. Y., Secretary.

U. S. CHAPTER, INTERNATIONAL COLLEGE OF SURGEONS, Waldorf-Astoria, New York, Sept. 13-17. Dr. Karl Meyer, 1516 Lake Shore Drive, Chicago 10, Secretary.

UTAH STATE MEDICAL ASSOCIATION, Salt Lake City, Sept. 10-12. Dr. Homer E. Smith, 42 South Fifth East St., Salt Lake City 2, Secretary.

WASHINGTON STATE MEDICAL ASSOCIATION, Olympic Hotel, Seattle, Sept. 13-16. Dr. Bruce Zimmerman, 338 White-Henry-Stuart Bldg., Seattle 1, Secretary.

FOREIGN

ASSOCIATION OF SURGEONS OF GREAT BRITAIN AND IRELAND, Leeds, England, May 13-15, 1954. Dr. Henry W. S. Wright, 45 Lincoln's Inn Fields, London W.C.2, England, Honorary Secretary.

CANADIAN MEDICAL ASSOCIATION, Vancouver, B. C., Canada, June 18-22, 1954. Dr. T. C. Routley, 135 St. Clair Ave. W., Toronto 5, Ont., Canada, General Secretary.

CONGRESS OF INTERNATIONAL ANESTHESIA RESEARCH SOCIETY, Chateau Frontenac, Quebec, Canada, October 26-29. Dr. A. William Friend, 515 Nome Ave., Akron 20, Ohio, Chairman, Program Committee.

CONGRESS OF THE INTERNATIONAL ASSOCIATION OF LIMNOLOGY, Cambridge and Windermere, England, Aug. 20-30. For information write: Professor G. C. Hutchinson, Osborn Zoological Laboratory, Yale University, New Haven, Conn., U. S. A.

CONGRESS OF THE INTERNATIONAL LEAGUE AGAINST RHEUMATISM, Geneva, Switzerland and Aix-les-Bains, France, Aug. 23-29. For information write: Dr. W. Tegner, The London Hospital, London E.1, England.

CONGRESS OF THE INTERNATIONAL SOCIETY OF ANGIOLOGY, Lisbon, Portugal, Sept. 18-20. Dr. Henry Haimovici, 105 East 90th St., New York 28, N. Y., U. S. A., Secretary.

CONGRESS OF THE INTERNATIONAL SOCIETY OF SURGERY, Lisbon, Portugal, Sept. 14-20. Dr. L. Dejardin, 141, rue Belliard, Brussels, Belgium, General Secretary.

INTERIM MEETING, AERO MEDICAL ASSOCIATION, University of Brussels Medical School, Brussels, Belgium, Sept. 24-27. Dr. Andre Allard, Medical Director of SABENA, 145 Rue Royale, Brussels, Belgium, Secretary.

INTERNATIONAL CANCER CONGRESS, Sao Paulo, Brazil, July 23-29, 1954. Prof. A. Prudente, 171 rua Benjamin Constante, Sao Paulo, Brazil, President.

INTERNATIONAL CONFERENCE ON THROMBOSIS AND EMBOLISM, Basle, Switzerland, July 15-19, 1954. Dr. W. Merz, Chief Medical Officer, Gynecological Clinic, University of Basle, Basle, Switzerland, Hon. Secretary.

INTERNATIONAL CONGRESS OF ACUPUNCTURE, Kolpinghaus, Adolf-Kolping-Strasse 1, Munich, Germany, August 22-25. Dr. G. Bachmann, 29 Lilienstrasse, München 9, Germany, Organizer and Secretary.

INTERNATIONAL CONGRESS OF ELECTROENCEPHALOGRAPHY AND CLINICAL NEUROPHYSIOLOGY, Boston, Mass., U. S. A., Aug. 18-21. Dr. Robert S. Schwab, Massachusetts General Hospital, Boston 14, Mass., U. S. A., Secretary-General.

INTERNATIONAL CONGRESS OF THE EUROPEAN SOCIETY OF HAEMATOLOGY, Amsterdam, Holland, Sept. 8-12. Dr. M. C. Verloop, Maliesingle 15, Utrecht, Holland, Secretary.

INTERNATIONAL CONGRESS ON GENETICS, Bellagio, Italy, August 24-31. Prof. C. Barigozzi, Instituto de Genetica, Universita de Milano, 10 via Celoria, Milan, Italy, Secretary.

INTERNATIONAL CONGRESS OF HIPPOCRATIC MEDICINE, Evian, France, Sept. 3-6. Prof. P. Delore, 13, rue Jarente, Lyon, France, Secretary-General.

INTERNATIONAL CONGRESS FOR HISTORY OF SCIENCE, Jerusalem, Israel, August 3-7. Prof. F. S. Bodenheimer, Hebrew University, Jerusalem, Israel, President.

INTERNATIONAL CONGRESS OF HYDROCLIMATISM AND THALASSOTHERAPY, Dubrovnik, Yugoslavia, May 8-16, 1954. Prof. C. Plavsic, Zeleni Venac 1, Belgrade, Yugoslavia, Secretary General.

INTERNATIONAL CONGRESS OF INTERNATIONAL COLLEGE OF SURGEONS, Sao Paulo, Brazil, April 26-May 2, 1954. Dr. Max Thorek, 1516 Lake Shore Drive, Chicago, Illinois, U.S.A., Secretary-General.

INTERNATIONAL CONGRESS OF LOGOPEDICS AND PHONIATRICS, Zurich, Switzerland, Sept. 1-5. Dr. Deso A. Weiss, 115 East 86th St., New York 28, N. Y., U. S. A., General Secretary.

INTERNATIONAL CONGRESS ON MENTAL HEALTH, University of Toronto, Toronto, Ontario, Canada, Aug. 14-21, 1954. For information write: Executive Officer, International Congress on Mental Health, 111 St. George St., Toronto, Ontario, Canada.

INTERNATIONAL CONGRESS OF MICROBIOLOGY, Rome, Italy, Sept 6-12. For information write: Dr. V. Puntoni, Citta Universitaria, Rome, Italy.

INTERNATIONAL CONGRESS ON OBSTETRICS AND GYNECOLOGY, Geneva, Switzerland, July 26-31, 1954. Dr. H. de Watteville, Maternité Hôpital Cantonal, Geneva, Switzerland, President.

INTERNATIONAL CONGRESS OF PAEDIATRICS, Havana, Cuba, Oct. 12-17. Prof. Felix Hurtado, 5a Avenue 124, Miramar, Havana, Cuba, President.

INTERNATIONAL CONGRESS OF PSYCHOLOGY, Montreal, Canada, June 7-12, 1954. For information write: Prof. H. S. Langfeld, International Union of Scientific Psychology, Eno Hall, Princeton University, Princeton, N. J., U. S. A.

INTERNATIONAL CONGRESS FOR PSYCHOTHERAPY, Zurich, Switzerland, July 21-24, 1954. Dr. H. K. Fierz, Theaterstrasse 12, Zurich 1, Switzerland, Secretary General.

INTERNATIONAL CONGRESSES OF TROPICAL MEDICINE AND MALARIA, Istanbul, Turkey, Aug. 28-Sept. 4. Professor Dr. Ihsan Sükrü Aksel, Tunel Meydam, Beyoglu, Istanbul, Turkey, General Secretary.

INTERNATIONAL CONGRESS OF ZOOLOGY, Copenhagen, Denmark, Aug. 5-12. Dr. Anton F. Bruun, The University, Copenhagen, Denmark, Secretary General.

INTERNATIONAL GERONTOLOGICAL CONGRESS, London and Oxford, England, July 12-22, 1954. Prof. R. E. Tunbridge, General Infirmary, Department of Medicine, The University, Leeds, England, President.

INTERNATIONAL LEPROSY CONGRESS, Madrid, Spain, Oct. 3-10. Dr. Felix Contreras, Moreto 15, Madrid, Spain, Secretary.

INTERNATIONAL NEUROLOGICAL CONGRESS, LISBON, Portugal, Sept. 7-12. Prof. Almeida Lima, Avenida do Brazil 53, Lisbon, Portugal, Secretary-General.

INTERNATIONAL OFFICE OF DOCUMENTATION OF MILITARY MEDICINE, Rome, Italy, Oct. 14-18. Colonel Medecin Prof. A. Campana, Office of the Ministero della Difesa-Esercito, Rome, Italy, Secretary.

INTERNATIONAL PHYSIOLOGICAL CONGRESS, Montreal, Canada, Aug. 31-Sept. 4. Dr. A. S. V. Burgen, Dept. of Physiology, McGill University, Montreal, Canada, Secretary.

INTERNATIONAL SOCIETY FOR THE STUDY OF BIOLOGICAL RHYTHMS, Basle, Switzerland, Sept. 18-19. For information write: Prof. Dr. F. Georgi, Neurologische Universitats-Poliklinik, Socinstrasse 55, Basle, Switzerland.

INTERNATIONAL VETERINARY CONGRESS, Stockholm, Sweden, Aug. 9-15. Prof. Axel Isaksson, Institute of Veterinary Medicine, Stockholm 50, Sweden, Secretary.

JOURNEES MEDICALES, Paris, France, April 21-25, 1954. For information write: Secretariat of the Journees, 12, rue Pierre-Geofroix, Colombes (Seine) France.

LATIN AMERICAN CONGRESS OF OBSTETRICS AND GYNECOLOGY, Buenos Aires, Argentina, Oct. 26-31.

LATIN AMERICAN CONGRESS OF OTORHINOLARYNGOLOGY, Caracas, Venezuela, Feb. 21-25, 1954. Dr. Victorino Marquez Reveron, Centro Medico, Caracas, Venezuela, Secretary-General.

PACIFIC SCIENCE CONGRESS, Quezon City and Manila, Philippines, Nov. 16-28. Dr. Patrocinio Valenzuela, College of Pharmacy, University of the Philippines, Quezon City, Philippines, Secretary-General.

PAN AMERICAN CONGRESS OF OTORHINOLARYNGOLOGY AND BRONCHOESOPHAGOLOGY, Mexico, D.F., Mexico, Feb. 28-March 4, 1954.

PAN AMERICAN MEDICAL WOMEN'S ALLIANCE, Beekman Towers Hotel, New York, N. Y., Sept. 24-Oct. 1. Dr. Ina Marsh, 140 Linwood Ave., Buffalo, N. Y., U. S. A., Registration Chairman.

PERSIAN GULF MEDICAL SOCIETY, Dhahran, Saudi Arabia, Dec. 7-8. Dr. N. J. Conan Jr., Department of Internal Medicine, Arabian American Oil Company, Dhahran, Saudi Arabia, Secretary.

SECTIONAL MEETING, AMERICAN COLLEGE OF SURGEONS, London, England, May 17-19, 1954. Dr. Michael L. Mason, 40 East Erie St., Chicago 11, Ill., U. S. A., Secretary.

WORLD CONFERENCE ON MEDICAL EDUCATION, British Medical Association House, Tavistock Square, W.C.1, London, England, Aug. 22-29. Secretariat: World Medical Association, 2 East 103d St., New York 29, N. Y., U. S. A.

WORLD CONGRESS OF THE WORLD CONFEDERATION FOR PHYSICAL THERAPY, London, England, Sept. 7-12. Miss M. J. Neilson, Chartered Society of Physiotherapy, Tavistock House, South, Tavistock Square, London, W.C.1, England, Secretary.

WORLD FEDERATION FOR MENTAL HEALTH, Vienna, Austria, Aug. 17-23. For information write: Miss E. M. Thornton, 19 Manchester St., London, W.1, England.

WORLD MEDICAL ASSOCIATION, The Hague, Netherlands, Aug. 31-Sept. 7. Dr. Louis H. Bauer, 345 East 46th St., New York 17, N. Y., Secretary-General.

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* All centers where there are five or more candidates. Sept. 8-10 (Part I only). Candidates may file applications at any time, but the National Board must receive them at least six weeks before the date of the examination they wish to take. Exec. Sec., Dr. John P. Hubbard, 133 South 36th St., Philadelphia 4.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: All candidates must now pass a written examination. *Written.* Various centers, Sept. 3. *Oral.* Philadelphia, Oct. 16-18. To be eligible, candidate must complete 36 months of training before Oct. 1. Final date for filing applications was May 1. Exec. Sec., Miss Janet Newkirk, 66 East 66th St., New York 21.

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* San Francisco, Sept. 30-Oct. 2, Chicago, Nov. 30-Dec. 2. The closing date for acceptance of applications for the San Francisco and Chicago oral examination was April 1. *Written.* October 19. The closing date for acceptance of applications was May 1. Exec. Sec.-Treas., Dr. William A. Werrell, 1 West Main St., Madison 3.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: *Oral.* New Haven, October. Final date for filing application was July 1, Sec., Dr. Leonard T. Furlow, Washington University School of Medicine, Kingshighway and Euclid Ave., St. Louis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written.* Various cities of the United States and Canada, Feb. 5. Application for examination or re-examination, as well as requests for resubmission of case reports, must be made prior to October 1. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

AMERICAN BOARD OF OPHTHALMOLOGY: Chicago, Oct. 5-9. *Written.* Various Centers, January 1954. Final date for filing applications was July 1. Sec., Dr. Edwin B. Dunphy, 56 Ivie Road, Cape Cottage, Maine.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Chicago, January 1954. Final date for filing application is August 15. Sec., Dr. Harold A. Sofield, 122 S. Michigan Ave., Chicago 3.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral.* Chicago, Oct. 5-9. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City.

AMERICAN BOARD OF PATHOLOGY: *Written. Pathologic Anatomy and Clinical Pathology.* Chicago, Oct. 8-10. Sec., Dr. William B. Wartman, 303 E. Chicago Ave., Chicago.

AMERICAN BOARD OF PEDIATRICS: *Oral.* Miami, Oct. 9-11; Indianapolis, Dec. 4-6. Exec. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

AMERICAN BOARD OF PLASTIC SURGERY: *Entire Examination.* San Diego, Oct. 29-31. Final date for receipt of case reports was June 1. Corres. Sec., Mrs. Estelle E. Hillerich, 4647 Pershing Ave., St. Louis 8.

AMERICAN BOARD OF PROCTOLOGY: *Part II. Oral and Written. Anorectal Surgery and Proctology.* Philadelphia, Sept. 19. Sec., Dr. Louis A. Buie, 102-110 Second Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY: *Oral. Radiology, Roentgenology, Diagnostic Roentgenology and Therapeutic Radiology.* Chicago, Dec. 6-11. Final date for filing application was July 1. Sec., Dr. B. R. Kirklin, 102-110 Second Ave. S.W., Rochester, Minn.

BOARD OF THORACIC SURGERY: *Written.* Various centers throughout the country, September 11. Final date for filing application was July 1. Sec., Dr. William M. Tuttle, 1151 Taylor Ave., Detroit 2.

DEATHS

Friedman, Emanuel David ⊕ New York City; born in New York Aug. 25, 1884; University and Bellevue Hospital Medical College, New York, 1907; instructor in medicine from 1913 to 1918 at his alma mater, where he was instructor of neuropathology from 1919 to 1922, lecturer of neuropathology from 1922 to 1924, clinical professor of neurology from 1924 to 1927, and professor of neurology and head of the department from 1927 to 1947, when he became professor emeritus; specialist certified by the American Board of Psychiatry and Neurology; member of the American Neurological Association, American Psychiatric Association, Harvey Society, Phi Beta Kappa, Phi Delta Epsilon, Alpha Omega Alpha, New York University chapter of Sigma Xi, Association for Research in Nervous and Mental Diseases, New York Academy of Medicine, and the New York Neurological Society, of which he was vice-president in 1938-1939 and president 1939-1940; president of the New York University College of Medicine Alumni Association 1937-1938; in 1949 received from the City College the Townsend Harris medal for outstanding postgraduate achievement in "some significant field of human endeavor"; member of the subcommittee on technical and scientific research, Noise Abatement Commission of New York City; chairman of the committee on neurology of Workmen's Compensation Board from 1935 to 1938; during World War I contract surgeon in the Army; neuropsychiatrist for the New York Medical Advisory Board under Selective Service Act from 1940 to 1943; lecturer, New York University School of Military Neuropsychiatry, 1944-1945; at various times on the staffs of the Israel Zion Hospital in Brooklyn, Bellevue Hospital, Montefiore Hospital for Chronic Diseases, Beth Israel Hospital, New York University division, Goldwater Memorial Hospital, Manhattan General Hospital, and Beth David Hospital; consultant in neuropsychiatry at the Veterans Administration; died in the Mount Sinai Hospital June 7, aged 68, of carcinoma of the stomach.

Harvey, James Alexander ⊕ Pasadena, Calif.; born in Chicago Nov. 6, 1867; Rush Medical College, Chicago, 1896; took postgraduate work at the universities of Glasgow, Vienna, and Berlin; member of the Illinois State Medical Society, Institute of Medicine of Chicago, Chicago Tuberculosis Institute, Society of Medical History, and the Association of Military Surgeons of the United States; an Associate Fellow of the American Medical Association; fellow of the American College of Surgeons; served as a colonel in the medical corps of the American Expeditionary Forces in France during World War I; for many years practiced in Chicago, where he was instructor in anatomy and surgery and assistant professor at his alma mater from 1899 to 1912, on the staffs of St. Luke's Hospital, Chicago Baptist Hospital, and on the advisory board of the Chicago Tuberculosis Sanitarium; died June 12, aged 85, of cerebral thrombosis.

Christianson, Harry Walter ⊕ Minneapolis; born in Belgrade, Minn., Aug. 5, 1893; University of Minnesota Medical School, Minneapolis, 1921; clinical assistant professor of surgery at his alma mater; specialist certified by the American Board of Proctology; specialist certified by the American Board of Surgery; member of the American Proctologic Society, Minneapolis Clinical Club, the Alumni Association of the Mayo Foundation, Phi Delta Chi, and Phi Beta Pi; fellow of the American College of Surgeons; entered the Mayo Foundation, Rochester, Minn., as a fellow in proctology in October, 1929, and left in October, 1932; served during World War II; on the staffs of the University of Minnesota, Minneapolis General, St. Barnabas, St. Andrew's, Norwegian Deaconess, Fairview, and Swedish hospitals; consulting proctologist, Maternity Hospital and University Health Service; died June 11, aged 59, of heart failure due to coronary sclerosis and diabetes mellitus.

⊕ Indicates Member of the American Medical Association.

Crenshaw, John Lewis ⊕ Rochester, Minn.; born in Elizabeth, N. J., Jan. 2, 1882; University of Virginia Department of Medicine, Charlottesville, 1906; specialist certified by the American Board of Urology; entered the Mayo Clinic in May, 1910, and became a consultant in the section of urology in October, 1911; appointed assistant professor of urology in 1920, and associate professor in 1923, the Mayo Foundation, where since 1944 he was a member of the emeritus staff; member of the American Association of Genito-Urinary Surgeons, American Urological Association and past president of its North Central Branch, the Alumni Association of the Mayo Foundation, Sigma Xi, and Phi Rho Sigma; during World War I a captain in the medical corps of the U. S. Army and chief of the urologic service at Embarkation Hospital, Camp Stuart, Newport News, Va.; died in St. Mary's Hospital June 17, aged 71, of bronchopneumonia and coronary sclerosis.

Wagley, Perry Vernon ⊕ Pontiac, Mich.; born in Harrison, Ark., Oct. 7, 1891; University of Arkansas School of Medicine, Little Rock, 1915; specialist certified by the American Board of Psychiatry and Neurology; past president of the Michigan Society of Neurology and Psychiatry; member of the American Psychiatric Association; served during World Wars I and II; consulting psychiatrist at Memorial Hospital, Owosso, Pontiac General Hospital, and St. Joseph Mercy Hospital; superintendent of Pontiac State Hospital; died June 1, aged 61, of coronary disease.

AbPlanalp, Ira Sankey, Williston, N. D.; St. Louis University School of Medicine, 1906; died in High Point Lodge, Palmer Township, Minn., March 22, aged 74.

Armistead, Ernest King ⊕ El Paso, Texas; Maryland Medical College, Baltimore, 1911; served during World War I; served on the staffs of the Providence Memorial and Southwestern General hospitals; died May 27, aged 68, of cardiac arrest.

Beauchamp, Joseph Octave ⊕ Springfield, Mass.; School of Medicine and Surgery of Montreal, Canada, 1894; formerly mayor of Chicopee, where he was city physician and alderman; affiliated with the Mercy Hospital; died in Chicopee Falls May 30, aged 84, of acute myelogenous leukemia.

Bentley, William Edmond, Howell Township, N. J.; Michigan College of Medicine and Surgery, Detroit, 1894; died in the New Jersey State Hospital, Marlboro, May 8, aged 87, of myocarditis.

Biggs, John Moore ⊕ Memphis, Tenn.; College of Physicians and Surgeons, Memphis, 1910; affiliated with the Shelby County Hospital, where he died June 1, aged 78, of myocardial insufficiency and coronary occlusion.

Brinker, Marion Henry ⊕ Jefferson, Iowa; State University of Iowa College of Medicine, Iowa City, 1930; past president of the Greene County Medical Society; on the staff of the Greene County Hospital, where he died June 7, aged 60, of acute myocarditis.

Buehl, Robert Frederick ⊕ Clearwater, Fla.; Indiana University School of Medicine, Indianapolis, 1918; served during World War I and as a member of the Selective Service in Indianapolis during World War II; formerly affiliated with the Indian Service; at one time practiced in Indianapolis, where he was on the staffs of Methodist and St. Francis hospitals; died in the VA Hospital, Bay Pines, April 12, aged 60, of arteriosclerotic heart disease.

Bull, Homer Thomas Reginald ⊕ Geneseo, N. Y.; University of Toronto Faculty of Medicine, 1927; certified by the National Board of Medical Examiners; past president of the Livingston County Medical Society; served during World War II; affiliated with Wyoming County Community Hospital, Warsaw, and Highland Hospital, Rochester; died June 1, aged 51, of coronary occlusion.

Campbell, William Muse, St. Joseph, Mo.; Northwestern Medical College, St. Joseph, 1893; died June 13, aged 80, of arteriosclerosis.

Carpenter, Herbert Bancroft ⊕ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1889; died May 26, aged 86, of coronary thrombosis.

Case, James Dodds, Lincoln, Neb.; Lincoln Medical College, Eclectic, 1901; died in St. Elizabeth Hospital March 31, aged 78, of myocardial decompensation following an operation for carcinoma of the bowel.

Charbonneau, Noe Napoleon, Belmont, Mass.; University of Vermont College of Medicine, Burlington, 1898; died May 11, aged 77.

Clear, James Thomas ⊕ Cincinnati; Ohio-Miami Medical College of the University of Cincinnati, 1912; member of the International College of Surgeons; fellow of the American College of Surgeons; affiliated with St. Mary's Hospital, St. Francis Hospital, and the Good Samaritan Hospital, where he died June 7, aged 63.

Clothier, Elton Forrest, Elk River, Minn.; University of Minnesota Medical School, Minneapolis, 1929; died in Little Falls March 28, aged 50, of myocardial infarction and coronary thrombosis.

Colby, Buford Monroe ⊕ Hale, Mo.; Washington University School of Medicine, St. Louis, 1915; at one time assistant superintendent of the Kansas City General Hospital in Kansas City, Mo.; died in the Atwood Hospital, Carrollton, June 15, aged 64, of coronary thrombosis.

Collier, Edward James ⊕ Amsterdam, N. Y.; Albany (N. Y.) Medical College, 1896; an Associate Fellow of the American Medical Association; on the staffs of the Amsterdam City and St. Mary's hospitals; trustee, Amsterdam Savings Bank; died May 14, aged 81, of a heart attack.

Collins, William Wells ⊕ Sunnyside, Wash.; Northwestern University Medical School, Chicago, 1929; served during World War II; chief of staff, Valley Memorial Hospital; died May 28, aged 50, of cerebral vascular accident.

Cothern, William Ross, Waterloo, Iowa; Rush Medical College, Chicago, 1900; died April 11, aged 82, of bronchopneumonia.

Cremer, Peter Hubert, Hastings, Minn.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; died March 22, aged 74.

Crowson, Egbert, St. Joseph, Mo.; Central Medical College of St. Joseph, 1903; died June 8, aged 81.

Currie, William E. ⊕ Sterling, Kan.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1900; formerly mayor, and member of the school board; served on the staff of the Sterling Hospital; for many years served on the board of trustees and executive committee of Sterling College; died June 5, aged 81, of cerebral hemorrhage.

Edwards, James Gettys ⊕ Okmulgee, Okla.; University of Nashville (Tenn.) Medical Department, 1908; past president of the Okmulgee County Medical Society and vice-president of the Oklahoma State Medical Association; on the staff of the Okmulgee City Hospital; died May 23, aged 72, of coronary occlusion.

Ehlert, William, Pass Christian, Miss.; Medical Department of Tulane University of Louisiana, New Orleans, 1900; died March 11, aged 76.

Ellis, Hubert, East Elmhurst, N. Y.; New York Homeopathic Medical College and Flower Hospital, New York, 1908; died in Middletown March 12, aged 73.

Evans, Ellis Austin ⊕ Conway Springs, Kan.; Marion-Sims-Beaumont Medical College, St. Louis, 1901; for many years resident surgeon for the Missouri Pacific Railroad; died May 30, aged 76.

Finley, William Albert ⊕ Cherokee, Ala. (licensed in Alabama in 1909); died in Decatur May 27, aged 78, of coronary thrombosis.

Foltz, Earl Dewitt ⊕ North Baltimore, Ohio; Western Reserve University School of Medicine, Cleveland, 1919; died April 10, aged 61, of coronary heart disease.

Galloway, Charles A., Henderson, Ky.; Louisville (Ky.) Medical College, 1883; died March 25, aged 94.

Glover, Lewis Pellman ⊕ Altoona, Pa.; Jefferson Medical College of Philadelphia, 1926; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology; chairman of the department of ophthalmology at Altoona Hospital; died April 22, aged 52, of a brain tumor.

Gorman, John Joseph, Fall River, Mass.; College of Physicians and Surgeons, Baltimore, 1908; served as medical inspector of schools for the city board of health; roentgenologist, Fall River General and St. Anne's hospitals; died May 28, aged 67, of cerebral hemorrhage and bronchopneumonia.

Grant, Lee Otis J. ⊕ Grand Rapids, Mich.; Marquette University School of Medicine, Milwaukee, 1926; fellow of the American College of Surgeons; on the staff of St. Mary's Hospital; died May 29, aged 54, of carcinoma.

Hardt, Harry Godfrey ⊕ Chicago; Rush Medical College, Chicago, 1900; formerly on the faculty of his alma mater and the University of Illinois College of Medicine; affiliated with Evangelical Hospital; died in Elmhurst June 5, aged 76, of diabetes mellitus.

Herring, Arthur F. C., Lafayette, Ind.; College of Physicians and Surgeons of San Francisco, 1903; died in the William Ross Sanitarium March 6, aged 77, of pulmonary tuberculosis.

Hight, William Boyd ⊕ Des Moines, Iowa; Jefferson Medical College of Philadelphia, 1895; died March 31, aged 79, of acute congestive cardiac failure.

Hodges, Dolon Ernest ⊕ Billings, Mont.; University of Louisville (Ky.) School of Medicine, 1927; specialist certified by the American Board of Urology; fellow of the American College of Surgeons; president-elect of the Montana Medical Association; served overseas during World War II; on the staffs of the St. Vincent and Billings Deaconess hospitals; died recently, aged 50, of coronary sclerosis.

Hornick, Leo William ⊕ Johnstown, Pa.; Jefferson Medical College of Philadelphia, 1912; past president and secretary of the Cambria County Medical Society; fellow of the American College of Surgeons; in 1928 received the honorary degree of LL.D. from his alma mater; past president of the board of managers of the Municipal Hospital; on the staffs of the Conemaugh Valley Memorial Hospital and the Mercy Hospital, where he died May 8, aged 65, of cerebral hemorrhage.

Houston, William M., El Dorado, Ark. (licensed in Arkansas in 1903); died June 1, aged 77, of a heart attack.

Kent, Leslie Swigart ⊕ Eugene, Ore.; Lincoln Medical College, Eclectic, Lincoln, Neb., 1917; member of the American Academy of General Practice; past president of the Oregon State Medical Society and the Lane County Medical Society; vice-president of the American Medical Women's Association; died in the Sacred Heart General Hospital May 26, aged 71, of metastatic carcinoma of the liver and lungs and carcinoma of the right breast.

Kreutzmann, Henry Adolph Robert ⊕ San Francisco; University of Pennsylvania School of Medicine, Philadelphia, 1916; specialist certified by the American Board of Urology; member of the American Urological Association; fellow of the American College of Surgeons; served overseas during World War I; formerly on the staffs of the Chinese and Mount Zion hospitals; died April 28, aged 62, of myocardial infarction and coronary arteriosclerosis.

Lamb, Harry Hayes, Oil City, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1904; for many years state senator; affiliated with Oil City Hospital, where he died May 4, aged 76, of pyelonephritis.

Lawrence, Edgar L. ✠ Roanoke, Va.; Medical College of Virginia, Richmond, 1900; died in the Shenandoah Hospital March 21, aged 83, following a fracture of the hip, received in a fall.

Lawson, John Alexander ✠ Rocky Ford, Colo.; Jefferson Medical College of Philadelphia, 1895; affiliated with Mennonite Hospital in La Junta, where he died May 7, aged 84, of uremia and congestive heart failure.

Lease, Nimrod James ✠ Crawfordsville, Iowa; State University of Iowa College of Medicine, Iowa City, 1892; died May 23, aged 83, of heart disease.

Lieberthal, David ✠ Chicago; Medizinische Fakultät der Universität, Wien, Austria, 1894; an Associate Fellow of the American Medical Association; specialist certified by the American Board of Dermatology and Syphilology; member of the American Urological Association; affiliated with the Michael Reese and Illinois Masonic hospitals; died in the Columbus Hospital June 10, aged 86, of cardiovascular accident due to arteriosclerosis.

Lockwood, Charles Edwin ✠ Montrose, Colo.; Tufts College Medical School, Boston, 1898; past president of the Montrose County Medical Society; formerly vice-president of the Colorado State Medical Society; formerly mayor of Olathe; served during World War I; for many years county physician; on the staff of St. Luke's Hospital; died in Emory John Brady Hospital, Colorado Springs, April 16, aged 81, of cerebral thrombosis and bronchopneumonia.

McClellan, William Thomas ✠ Stollings, W. Va.; Kentucky University Medical Department, Louisville, 1905; died in Logan May 15, aged 80, of cerebral hemorrhage.

McCullough, John Henry, Newberry, S. C.; Southern Medical College, Atlanta, 1891; served as county physician for many years; on the staff of the Newberry County Memorial Hospital, where he died June 28, aged 83, of cerebral hemorrhage.

Marr, Raymond ✠ Cincinnati; University of Cincinnati College of Medicine, 1939; member of the Industrial Medical Association; assistant medical director of the Cincinnati Milling Machine Company; died in the Holmes Hospital May 12, aged 48.

Martin, Ross Christman ✠ San Bernardino, Calif.; University of Louisville (Ky.) Medical Department, 1912; served on the staff of St. Bernardine's Hospital; died in the Redlands Community Hospital in Redlands April 18, aged 64, of nephritis.

Maurer, Franklin ✠ Springfield, Ill.; Northwestern University Medical School, Chicago, 1908; served during World War I; died in St. John's Hospital May 24, aged 68, of coronary thrombosis.

Moore, Baxter Springs, Fayetteville, N. C.; University of Virginia Department of Medicine, Charlottesville, 1902; formerly clinical professor of surgery at the North Carolina Medical College, Charlotte; served during World War I; associated with Veterans Administration in Charlotte and Fayetteville; died May 10, aged 74.

Morgan, Browne ✠ Bloomfield, N. J.; Columbia University College of Physicians and Surgeons, New York, 1898; served during World War I; affiliated with Newark (N. J.) Eye and Ear Infirmary; died in the Community Hospital, Montclair, May 27, aged 79, of carcinoma of the lung.

Peterka, Edward, Cleveland; Western Reserve University Medical Department, Cleveland, 1905; fellow of the American College of Surgeons; affiliated with St. Alexis Hospital; died May 23, aged 73.

Peterson, James Rumbaugh ✠ Seattle; Western Pennsylvania Medical College, Pittsburgh, 1911; served during World War I; died May 19, aged 71.

Prentiss, Marvin B., Clermont, Fla.; Michigan College of Medicine and Surgery, Detroit, 1896; served for one term in the state legislature of Oklahoma; died in Nowata, Okla., May 3, aged 83, of arteriosclerosis.

Prichard, Marvin Compton ✠ Long Beach, Calif.; University of Louisville School of Medicine, 1933; specialist certified by the American Board of Radiology; member of the American College of Radiology; formerly instructor in radiology at the University of Chicago Clinics; on the staff of the Seaside Memorial Hospital; died May 5, aged 43, of coronary heart disease.

Purcell, James Bernard ✠ Wilkes-Barre, Pa.; Jefferson Medical College of Philadelphia, 1926; member of the American Urological Association; fellow of the American College of Surgeons; city physician; assistant surgeon for the D. & H. Railroad; affiliated with Mercy Hospital, where he died May 13, aged 55, of perforation of the abdominal aorta.

Reim, Hugo ✠ St. Louis; Barnes Medical College, St. Louis, 1904; assistant professor of clinical ophthalmology at St. Louis University School of Medicine; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology; affiliated with Firmin Desloge Hospital and the Shriners Hospital for Crippled Children; died in the Deaconess Hospital April 15, aged 70, of carcinoma.

Rigterink, George H. ✠ Hamilton, Mich.; Detroit College of Medicine, 1900; past president of the Allegan County Medical Society; died in the Borgess Hospital, Kalamazoo, April 19, aged 80.

Roche, Arthur Felix ✠ Hartford, Conn.; Georgetown University School of Medicine, Washington, D. C., 1917; member of the American Academy of Allergy; served during World War I; affiliated with St. Francis and McCook hospitals; died April 11, aged 59, of coronary thrombosis.

Rodgers, Lewis Aretus ✠ Oskaloosa, Iowa; State University of Iowa College of Medicine, Iowa City, 1889; past president of the Mahaska County Medical Society; died April 20, aged 89, of cerebral hemorrhage.

Salinger, Simon F., Chicago; Western Pennsylvania Medical College, Pittsburgh, 1897; died June 4, aged 92, of coronary heart disease and arteriosclerosis.

Sawyer, Alpha Reuben ✠ Lexington, Mass.; McGill University Faculty of Medicine, Montreal, Canada, 1905; member of the American Urological Association; died May 13, aged 71.

Schaefer, John F. ✠ New York City; Schlesische Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau, Germany, 1927; formerly affiliated with the Indian Service; died in Brentwood, N. Y., April 15, aged 51.

Schamberg, Morris I., New York City; Medico-Chirurgical College of Philadelphia, 1898; also a graduate in dentistry; formerly professor of oral surgery at the New York Post-Graduate Medical School, and his alma mater; veteran of the Spanish-American War; served on the staff of the Bronx Hospital; died May 20, aged 78.

Selo, Herbert Louis ✠ Findlay, Ohio; Universität Köln (Cologne) Medizinische Fakultät, Köln, Prussia, Germany, 1923; member of the American Academy of General Practice; on the staff of the Blanchard Valley Hospital; died April 9, aged 54, of coronary thrombosis.

Simmons, John A. ✠ Arcadia, Fla.; University of Arkansas School of Medicine, Little Rock, 1905; died April 25, aged 75, of coronary thrombosis and coronary sclerosis.

Smith, Glenn Jones, Amite, La.; American Medical College, St. Louis, 1906; member of the American Psychiatric Association; served during World War I; for many years served on the state board of education; for many years superintendent of the East Louisiana State Hospital at Jackson; died May 24, aged 71, of cerebral hemorrhage.

Smith, Victor Conway ✠ New Orleans; Medical Department of Tulane University of Louisiana, New Orleans, 1899; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; formerly on the faculty of his alma mater; member of the staff of the Eye, Ear, Nose and Throat Hospital, Illinois Central Railroad Hospital, and the Baptist Hospital, where he died May 19, aged 78, of acute leukemia.

Smith, Warren Clifton, Benton, Miss.; Memphis (Tenn.) Hospital Medical College, 1906; served on the staffs of the Kings Daughters Hospital and Yazoo Clinic and Hospital in Yazoo City; died May 1, aged 68, of arteriosclerosis.

Smith, Will Remeses, Huntington Park, Calif.; Marion-Sims College of Medicine, St. Louis, 1895; died in VA Center, Los Angeles, March 25, aged 85, of terminal bronchopneumonia and adenocarcinoma of the prostate.

Staton, Torrence Ripley ⊕ Atlanta, Ga.; Emory University School of Medicine, Atlanta, 1930; served during World War II; died near Forsythe July 5, aged 46, of injuries received in a private plane accident.

Stimson, George William ⊕ Warren, Ohio; University of Pennsylvania School of Medicine, Philadelphia, 1903; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; on the staffs of the Warren City Hospital and Trumbull Memorial Hospital; died April 20, aged 73.

Stocker, Harry ⊕ Detroit; Northwestern University Medical School, Chicago, 1923; on the staffs of the Sinai and East Side General hospitals; died May 5, aged 56, of coronary disease.

Sum, Othmar John, Barnhart, Mo.; St. Louis University School of Medicine, 1921; served during World War I; died May 1, aged 61, of heart disease.

Swift, Samuel ⊕ Bronxville, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1913; fellow of the American College of Surgeons; died in the Lawrence Hospital May 30, aged 66, of acute pulmonary edema and hypertension.

Tenczar, John Francis ⊕ Chicago; University of Illinois College of Medicine, Chicago, 1927; on the staff of St. Mary of Nazareth Hospital, where he died May 22, aged 53, of carcinomatosis.

Thieme, Harry Lankford ⊕ St. Louis; St. Louis University School of Medicine, 1924; member of the Industrial Medical Association; affiliated with Barnes, Jewish, Missouri Baptist, and Alexian Brothers hospitals; died May 29, aged 51, of injuries received in an automobile accident.

Thornton, Francis Eugene ⊕ Chicago; Bennett Medical College, Chicago, 1888; an Associate Fellow of the American Medical Association; formerly on the faculty of his alma mater; affiliated with the Norwegian American Hospital and for many years on the staff of the Cook County Hospital; died May 14, aged 88, of carcinoma of the bladder.

Townsend, Wilmot Charles ⊕ Hartford, Conn.; Harvard Medical School, Boston, 1925; certified by the National Board of Medical Examiners; fellow of the American College of Physicians; served during World War I; received the Bronze Star for his services in the Mediterranean theatre during World War II; consultant, New Britain (Conn.) General Hospital and the Institute for Living; on the staff of the Hartford Hospital, where he died May 10, aged 55, of coronary disease.

Van Studdiford, Martin Thomas ⊕ New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1918; professor of clinical dermatology at his alma mater; specialist certified by the American Board of Dermatology and Syphilology; member of the American Dermatological Association and the American Academy of Dermatology and Syphilology; affiliated with National Leprosarium in Carville, La., U. S. Marine Hospital, Hotel Dieu, Sisters' Hospital, and Charity Hospital; died May 15, aged 62, of leukemia.

Veneruso, Leonard Charles ⊕ Trumbull, Conn.; New York Medical College, Flower and Fifth Avenue Hospitals, New York, 1942; certified by the National Board of Medical Examiners; served during World War II; affiliated with Bridgeport (Conn.) Hospital, where he died May 1, aged 35, of acute coronary occlusion.

Wadsworth, John V. ⊕ Buffalo; University of Buffalo School of Medicine, 1921; affiliated with Edward J. Meyer Memorial Hospital; on the staffs of the Buffalo General Hospital and the Millard Fillmore Hospital, where he died May 6, aged 58, of acute myocardial infarction.

Wahl, Spencer Alwyn ⊕ Cleveland; Western Reserve University School of Medicine, Cleveland, 1920; died in Bethesda, Md., May 21, aged 57, of cerebral hemorrhage and hypertension.

Wallin, Maurice Benjamin, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1907; died in Rochester, Minn., May 22, aged 65, of carcinoma of the lung.

Walton, Josiah Harry ⊕ Clayton, Mo.; Barnes Medical College, St. Louis, 1902; died May 30, aged 79, of carcinoma.

Wenstrand, David E. W. ⊕ Tryon, N. C.; Northwestern University Medical School, Chicago, 1900; member of the State Medical Society of Wisconsin; past president, vice-president, and secretary of the Milwaukee Academy of Medicine; an Associate Fellow of the American Medical Association; past president and vice-president of the Association of Life Insurance Medical Directors; formerly director of the Northwestern Mutual Life Insurance Company; died June 4, aged 77, of coronary occlusion.

White, Wendell Jones ⊕ Vinita, Okla.; University of Arkansas School of Medicine, Little Rock, 1948; member of the Arkansas Medical Society; served during World War II; affiliated with Eastern State Hospital; died May 10, aged 30.

Widing, Herbert Andrew ⊕ Philadelphia; Jefferson Medical College of Philadelphia, 1927; affiliated with Jefferson and Presbyterian hospitals; died May 30, aged 52.

Wilder, Don Eugene ⊕ Booneville, Ky.; University of Louisville School of Medicine, 1929; served as health officer of Carter, Owsley, Lawrence, and Breathitt counties; formerly secretary and treasurer of the Carter County Medical Society; died in St. Joseph Hospital, Lexington, April 5, aged 48, of a fractured skull sustained in a fall.

Williams, John Watkins, Williamston, N. C.; University of Maryland School of Medicine, Baltimore, 1906; health officer of Martin County; formerly health officer of Asheville; served as director of Quachita Parish (La.) Health Unit; past president of the North Carolina Public Health Association; died in Martin General Hospital May 19, aged 68, of uremia and auricular fibrillation.

Worthington, Ernest Jerome ⊕ Chicago; Chicago College of Medicine and Surgery, 1917; past president of the West Side Branch of the Chicago Medical Society; past president of the West Side Hospital; served on the staff of Bethany Hospital; died May 23, aged 62.

Wright, Harper ⊕ Oklahoma City, Okla.; Atlanta College of Physicians and Surgeons, 1913; past president of the Oklahoma State Board of Medical Examiners; on the staff of the Wesley Hospital; died in Cuthbert, Ga., May 30, aged 65, of coronary thrombosis.

DIED WHILE IN MILITARY SERVICE

Goodwin, Robert Franklin, Bremerton, Wash.; University of Tennessee College of Medicine, Memphis, 1949; interned at the Wichita (Kan.) Hospital; lieutenant (jg), U. S. Naval Reserve; served at the Naval Hospital in Bremerton at the time of his death April 1, aged 34, of injuries received in an automobile accident.

Richards, Arthur Charles Jr. ⊕ Ambler, Pa.; born in Philadelphia Aug. 2, 1914; Jefferson Medical College of Philadelphia, 1943; interned at the Williamsport (Pa.) Hospital; served a residency in obstetrics and gynecology at the Grace-New Haven Community Hospital in New Haven, Conn., and the Pennsylvania Hospital in Philadelphia; captain, medical corps, U. S. Army Reserve, serving in Korea since January as a medical adviser to the 6th ROK Division; died May 14, aged 38, of injuries received in a helicopter crash near Hwanchon Reservoir, Korea.

GOVERNMENT SERVICES

ARMY

Personal.—Lieut. Col. Charles D. Shields (MC) formerly commissioner of health for Buffalo, N. Y., has reported to the Army Surgeon General's office for duty as chief physical medicine consultant in the Professional Division, effective July 1. Colonel Shields replaces Col. Emmett M. Smith (MC), who has been assigned to Europe.

Colonel Shields' most recent assignment was as chief of the Physical Medicine Service at Brooke Army Hospital, Fort Sam Houston, Texas. During World War II, he served as commanding officer of the 87th Station and 141st General hospitals and later as public health officer with the Allied Control Commission in Italy. From 1944 to 1946 he served as health officer for Bavaria. Colonel Shields left the Army in 1946 to accept a position with the city of Buffalo as commissioner of health. He joined the Regular Army in 1947.

DEPARTMENT OF DEFENSE

Medical Advisory Council.—The Armed Forces Medical Policy Council was dissolved on April 1, 1953. At the same time, the Secretary of Defense appointed a Civilian Health and Medical Advisory Council, consisting of six members of the health and medical professions of the United States.

Medical advisory council (left to right): Dr. William S. Middleton; Dr. Anthony J. J. Rourke; Dr. Dwight L. Wilbur; Dr. Melvin A. Casberg, assistant to the Secretary of Defense (Health and Medical); Dr. Alfred R. Shands Jr.; Dr. Isidor S. Ravdin; and James P. Hollers, D.D.S.

NAVY

Personal.—Capt. Ashton Graybiel (MC) has been chosen president-elect of the American College of Cardiology. Captain Graybiel, now Coordinator of Medical Research, Naval School of Aviation Medicine, Pensacola, Fla., was awarded the Legion of Merit in 1952 for outstanding service as director of research at the School of Aviation Medicine. The Aero-Medical Association awarded its Lyster award for 1950 to Captain Graybiel for outstanding scientific contributions to aviation medicine. The citation accompanying the award recognized his co-authorship of the book "Electrocardiography in Practice."

AIR FORCE

Personal.—Dr. John A. Schilling, assistant professor of surgery at the University of Rochester School of Medicine, Rochester, N. Y., has been appointed head of the department of surgery at the U. S. Air Force School of Aviation Medicine, Randolph Field, Texas.

PUBLIC HEALTH SERVICE

Radioactive Cortisone Available.—A limited supply of radioactive cortisone and hydrocortisone is now available without charge to qualified investigators through funds supplied by the Public Health Service's National Institute of Arthritis and Metabolic Diseases. Both are labeled at position 4 with C^{14}; cortisone has a specific activity of 0.49 mc./m. mole; and hydrocortisone a specific activity of 1.47 mc./m. mole. Requests, in the form of a letter concisely describing the proposed research, should be sent to the Division of Research Grants, National Institutes of Health, Bethesda 14, Md. Transfer and use of these materials are subject to current Atomic Energy Commission regulations.

Personal.—Dr. Clifton K. Himmelsbach has been appointed assistant chief, division of hospitals, U. S. Public Health Service, effective July 20. Dr. Himmelsbach was formerly medical officer in charge of the P. H. S. Outpatient Clinic, Washington, D. C. He succeeds Dr. Myron D. Miller, who has been appointed medical officer in charge of the P. H. S. Hospital, Seattle.——Dr. James R. Shaw has been appointed chief medical officer of the Bureau of Indian Affairs, U. S. Department of the Interior, effective July 13. Dr. Shaw was formerly chief of the division of hospitals, U. S. Public Health Service. He succeeds Dr. Fred Foard, who has retired from the Public Health Service.

VETERANS ADMINISTRATION

Personal.—Dr. Benedict Nagler, associate professor of neuropsychiatry at the Medical College of Virginia and chief of the neuropsychiatric service at the VA Hospital in Richmond, Va., will become chief of the neurology section of the psychiatry and neurology division, department of medicine and surgery, effective July 19, 1953. Dr. Nagler will succeed Dr. Tiffany Lawyer Jr., who is leaving the Veterans Administration to accept a teaching assignment in Georgetown University Medical School, Washington, D. C. In his new position, Dr. Nagler will coordinate policies in the treatment of more than 10,000 veteran patients suffering from neurological diseases in VA Hospitals and Outpatient Clinics. He will serve under Dr. Harvey J. Tompkins, chief of the psychiatry and neurology division.——Dr. Peter A. Peffer, manager of the VA Hospital at Perry Point, Md., is to be manager of the new 958 bed neuropsychiatric VA Hospital nearing completion at Brockton, Mass. Dr. Earl P. Brannon, chief of professional services at the Perry Point hospital, has been appointed manager at that installation. Dr. Joseph L. Campbell, former manager of the VA Hospital at Butler, Pa., becomes manager of the VA Hospital in Dwight, Ill. He succeeds Dr. M. H. Fineberg, recently transferred as manager of the VA Hospital in Wilkes-Barre, Pa. Dr. Fineberg was certified by the American Board of Internal Medicine in 1939, after 12 years of private practice in Cleveland. He served in the Army Medical Corps from July, 1941, until June, 1946.——Eugene K. Ricker, manager of the VA Hospital in Fort Bayard, N. Mex., becomes manager of the VA Domiciliary at Camp White, Ore. He succeeds Paul A. Hatton, transferred to the VA Center in Hot Springs, S. D.——Dr. Louis B. Newman, chief, Physical Medicine and Rehabilitation Service, VA Hospital, Hines, Ill., addressed the staff of the Memorial Hospital, St. Joseph, Mich., May 26, on "The Value of Physical Medicine and Rehabilitation."——Dr. John G. Hood of Richmond, Va., has been appointed manager of the VA Hospital in the Bronx, New York City, to succeed Dr. Ralph G. Devoe, who is retiring.

FOREIGN LETTERS

BRAZIL

Hematological Aspects of Lupus Erythematosus Disseminatus.—Disseminated lupus erythematosus causes a true and extensive reticuloendotheliosis, involving the reticulohistiocytes and the fundamental substance of the collagen as well. It produces a real "mesenchymatosis," explaining the serious alterations of the hematopoietic organs and the various deviations in the blood picture. Dr. Michel Jamba, of the department of clinical medicine, São Paulo State University, in collaboration with the staff of the central laboratory of the Hospital das Clinicas, published a report of repeated examinations in 15 cases of disseminated lupus erythematosus (*Revista Paulista de Medicina* **42:**171, 1953). The hematological aspects of the reticuloendotheliosis were analyzed to emphasize some points that may help the practitioner in making an early diagnosis of the disease. The authors stress the importance of noncutaneous forms, pointing out that most of them (11 out of 15, or 73.3%) have a chronic course that permits the distinction of four principal forms, according to the presence or absence of cutaneous lesions. The acute visceral form of the disease may occur in some cases without skin lesions, this being the reason why the disease is called "disseminated lupus" or "lupous collagenosis."

In this series, only 2 of 15 patients were males and 2 were of older age (58 and 61 years). Anemia occurred in all patients at some time during the natural course of the disease. Leukopenia was found in only two patients, and leukocytosis was not uncommon in connection with intercurrent complications or as a result of the treatment. Platelet reduction occurred in four patients but without simultaneous leukopenia. A male patient had thrombocytopenic purpura, with petechiae, purpuric maculas, and intestinal hemorrhage. In patients with slight hypertension, renal lesions, and hepatic and splenic enlargement, the positivity of the lupus erythematosus cell (Hargraves) test led to the exact clinical diagnosis. The bone marrow study in seven patients permitted the demonstration of some inhibition of the neutrophilic granulocyte maturation, and a relative hypoplasia of the erythroblastic cells, and in all patients an increase of the plasmocytes.

The lupus erythematosus cell test is, in the authors' opinion, pathognomonic. When performed in 97 cases, it was not positive in 28 other pathological conditions. In order that the test may be performed without error, it is necessary to use some "reactive" leukocytes, as some white blood cells are "hyporeactive" or even "nonreactive" to the gamma globulin responsible for the lupus erythematosus cell phenomenon. As the clinical picture of disseminated lupus erythematosus is very complex and frequently ill-defined, the authors believe that the lupus erythematosus cell test is indispensable when, without clear explanation, there are symptoms and signs like elevation of temperature, accelerated blood sedimentation rate, anemia, hyperglobulinemia, and plasmocytic infiltration of the bone marrow, idiopathic thrombocytopenia with sudden onset late in life, liver and spleen enlargement without hemopathic disorders associated with elevation of temperature, pulmonary infiltrations associated with temperature elevations, and recurrent pleural effusions. In the performance of the test, they recommend the use of positive plasma as a control of the reactivity of the "leukocytic cream" that is to be mixed with the plasma being tested.

Humoral Immunity of Dogs Infected with Trypanosoma Cruzi.—In the last two years, Drs. Julio Muniz and Rostan Soares, at the Institute of Malariology, National Department of Health, have been studying the various aspects of immunity in dogs experimentally infected with Trypanosoma (Schizotrypanum) cruzi. They have prepared a report for the *Revista Brasileira de Malariologia,* with the principal results of their work up to the present time. They performed, with the techniques already described in previous papers, the following tests: complement fixation test, precipitin test, agglutination reaction, and hemolytic and agglutination powers for sheep's blood cells.

The conclusion of the authors is that the establishment of immunity of dogs against T. cruzi follows a general course similar to that in man, though some differences may be recognized. Thus, the agglutinin content was found to be lower than in man, specially in the patent stage of the disease. Contrarily, the precipitin content showed itself to be markedly higher and more persistent, particularly in the postpatent stage. A close relationship between the agglutination and the precipitation powers, such as occurs in man, was not observed in the authors' experiments. Another difference disclosed by the experiments was the absence of antibodies of the heterophilic type, which are found in high concentration in human infections, especially during the patent stage. A justifiable explanation of this fact, in the opinion of the authors, is the presence of Forssman's antigen in the dog.

Pulmonary Resections.—Dr. Jesse Teixeira, head surgeon of the Rio de Janeiro Santa Maria Tuberculosis Hospital, published in *Revista Brasileira de Cirurgia* (**25:**551, 1952) a comprehensive report on 38 consecutive cases of pulmonary resections with some valuable information for the practitioner. After a review of the fundamental phases of the historic development of the methods for this kind of operation and a description of techniques, the author analyzes the indication for pulmonary resection, especially in connection with lung tumors, chronic bronchopulmonary suppurations, and pulmonary tuberculosis. He illustrates each of these points with the experience of his cases, a summary of which may be presented as follows. In 7 cases the operation was done for pulmonary tumors, in 17 for bronchopulmonary suppurations, and in 14 for pulmonary tuberculosis. Total pneumonectomies were done in 24 cases (on the right in 10 and the left in 14). Lobectomies were done in 14 cases, with one lobe being removed in 13 cases and 2 lobes in 1. Anesthesia with spontaneous breathing was used in the first series of 15 and anesthesia with controlled breathing in the second series of 24. There were nine deaths immediately postoperatively in the first series and none in the second. The causes of death in the first series were irreversible shock in three cases, cerebral and coronary gaseous embolism in 1 (established at autopsy), cardiac arrest during the operation in two cases, and uncontrollable hemorrhage during the operation in one case. Two patients died suddenly with change of posture at the end of the procedure. There were two deaths that did not occur immediately after the operation in the first series (one due to tuberculosis after 7 days and one due to cancer after 18 months), and three in the second series (one from tuberculosis after 12 days, one from cancer after 3 months, and one from tuberculosis after 7 months). The author stresses the importance of modern techniques, which decrease the immediate postoperative mortality, and emphasizes the superiority of anesthesia with controlled respiratory methods in thoracic surgery.

Intestinal Schistosomiasis in São Paulo.—Drs. J. Alves Meira and José M. Ferreira, professor and assistant professor of tropical medicine, São Paulo State University, reported three more cases of intestinal schistosomiasis in the interior of the state of São Paulo. In one case in which the patient lived at Ourinhos the disease was considered truly autochtonous, since infected snails were found by Dr. Luis Rey in a small stream of the vicinity. The Ourinhos focus was the first to be discovered in the uplands of São Paulo. The other two cases were discovered at Palmital and Ipauçú, where, in previous surveys, Dr. Samuel Pessoa and Dr. J. O. Coutinho have found uninfected planorbid snails of the genus Astralorbis. Considering the present great

The items in these letters are contributed by regular correspondents in the various foreign countries.

migration of persons from highly infected tropical districts of Brazil, and the possibility of the presence of snails of susceptible species in the São Paulo uplands, the authors foresee the existence of new foci of the disease in the interior of São Paulo.

DENMARK

Late Effects of Gastric Resection.—Follow-up studies of patients whose stomachs have been resected for gastric or duodenal ulcers have become more important than ever because of the growing competition between the operative and conservative treatment of such ulcers. The keenness of this competition is emphasized by the growing efficacy of both measures. Improvements of operative technique and of both preoperative and postoperative therapy have greatly reduced the operation risks, but at the same time advances in conservative and medicinal treatment have added greatly to the attractiveness of this alternative. To ascertain what happens to resected cases after a considerable observation period physicians on the staff of the Copenhagen County Hospital in Gentofte have undertaken a follow-up study of the 99 patients (82 men and 17 women) who underwent gastric resection for ulcers in the period 1939-1949. These physicians (Drs. Bent Bjerre, John Engberg, and Ulrik Feldthusen) point out in an article in *Ugeskrift for laeger* for Jan. 8 that the resection was the Billroth's operation in 94 cases, in most of which an enteroanastomosis was established. An attempt was made to resect between two-thirds and three-quarters of the stomach, the indications for operation being very strict, particularly during the first few years of the period under review, with marked invalidism and inability to work in most cases. More than two-thirds of the patients were over the age of 40, with a history of ulcers for 10 years or more.

The follow-up study showed that 7 of these 99 patients had died in connection with the operation, and another 7 had died of various conditions some years after it. Among 81 surviving patients, 18 were completely symptom-free from one and one-half to several years after the operation. Ten patients were still more or less invalids and unfit for work because the operation results were bad. There remained a large intermediate group of 53 patients who, after the same observation period, were subjectively well but objectively rather unsatisfactory, and the quality and quantity of their food had to be regulated with care. Among the 81 patients there were only 3 who frankly declared that they regretted having undergone this operation. On the other hand, most of them spontaneously expressed their gratitude for it. In nearly every case caloric needs could be satisfactorily met by the normal number of meals, and it was exceptional for working capacity not to be improved. In the present publication no reference is made to any original control investigation depending on the follow-up study of cases given conservative treatment only.

MEXICO

Activities of the Institute of Public Health and Tropical Diseases.—The activities and work of the Institute of Public Health and Tropical Diseases, Mexico City, have not always been widely known because they are usually very specialized. On the occasion of the 14th anniversary of the institution its secretary, Dr. Manuel González Rivera, issued an extensive report that reviews the most important investigations and research done since 1939. Following are some of the points of that report.

Laboratory and outside research on whooping cough has been carried out for several years. For four years the value of pertussis vaccine in active immunization has been investigated, as well as determination of the effect of agglutinations of Hemophilus pertussis in blood of vaccinated and nonvaccinated adults. Other investigations included a study on the passage of pertussis antibodies through the placenta and observations on passive immunization with serum of pertussis-immunized subjects.

In cooperation with the International Salmonella Center of Copenhagen, the Salmonella Center of Mexico was organized in 1939. It is dedicated to the study of the bacteriological, medical, and sanitary aspects of salmonellosis and to the study of the disease in humans, particularly children. Salmonellas have been found (in Mexico) to be the cause of many so-called diarrheas, cases of enteritis, and intestinal fevers.

Specific, somatic, and K serums have been prepared that correspond to the 25 groups of the Kauffann-Knyschildt-Vahlne (KKV) antigenic diagnostic diagram. At the same time studies on the antigenic structure of micro-organisms of the coliform group (Escherichia, Aerobacter, Klebsiella, and paracolon) were begun. The "O" group has been determined in 508 cultures (according to the KKV diagram) of coliforms isolated in man, rats, and butter. It has been found that cultures from the intestine of the rat belong to a different serologic group than those of human origin.

Three new species of Salmonella have been described: S. mexicana, S. pensacola (Analmac variety), and S. liceagai (in memory of Dr. Eduardo Liceaga). Several varieties of coliform bacilli that possess Salmonella antigens have also been described. Lately the rat salmonellas of Mexico have been studied. In 1951 the Salmonella and virus laboratory of the institute was designated regional center for the study and classification of salmonellas in all of Central America. The effect of alum on S. typhi and S. paratyphi A and B, was studied to determine the possibility of active immunization against typhoid and paratyphoid with a single dose of paratyphoid vaccine precipitated with alum and also the possibility of producing active immunization in man against the most frequent varieties of pathogenic Salmonella.

The bactericidal and bacteriostatic effect of a new chemical compound, aluminum para-aminobenzene sulfonate (Sulfalumin) on S. typhi, Shigella, Escherichia coli, Staphylococcus aureus, Streptococcus haemolyticus, Brucella abortus, and Br. melitensis was studied, as well as the synergistic action of this drug with penicillin on S. typhi. Other research in the field of brucellosis has been the investigation of agglutination tests in brucellosis patients, and the antigenic and allergic aspects of brucellosis; the differentiation of the type of Brucella by the complement fixation test; culture of Brucella organisms; and forms of treatment of the disease.

Vaccination of white rats against brucellosis was tried. Other work in this field refers to hydrogen sulfide metabolism in Br. melitensis, the role of the spleen in experimental brucellosis, transformation of smooth into rough cultures, determination of nitrogen in different samples of anti-Brucella vaccine, and histopathological studies of human and animal cases of brucellosis.

Research on classic and murine typhus in the laboratory, in clinical cases, and in the field has been related to different aspects of rickettsiosis, preparation of vaccines, immunology and allergy of the disease, agglutination, and complement fixation tests. The distribution of typhus in Mexico has been studied by means of the complement fixation test with murine and classic antigens. The complement fixation test was done with the two typhus rickettsias and with agglutinations of Proteus OX19 in more than 2,500 rats in Mexico City. A low incidence of infected rats was found.

The antigenic fraction (belonging to rickettsias) was investigated in 1,200 cultures of coliform bacilli using the serum of typhus patients. Experiments on fatal infections with Rickettsia prowazekii moorseri in a race of white mice CFCW were done in comparison to the resistance of ordinary white mice. A race was found that is highly susceptible to experimental exanthematous typhus.

A new serologic test for the diagnosis of typhus was described based on the precipitation of antityphus serums by the urine of typhus patients. A modified Weil-Felix reaction and a fast slide method were also described. Experiments on treatment of typhus with serum of convalescent rabbits and other chemical products have been carried out. R. rickettsii was isolated for the first time in Mexico in Choix in the state of Sinaloa in 1943. Later it was found in other parts of Sinaloa, at Sonora and La Laguna.

Continuing the work in recurrent fever, two new outbreaks in Saltillo, Coahuila, and Espíritu Santo, Zacatecas, were localized, where numerous specimens of Ornithodoros turicata were collected and proved to be highly infected with Spirochaetae. In the state of Coahuila a new species of recurrent fever Spirochaeta was found, as were two new species of Ornithodoros, carriers of this disease.

The following work has been done on pinta: morphological study of the Treponema carateum, first under the ordinary microscope and later with the electronic microscope, attempts at culture and inoculation of the Treponema, and a comparative study of the Wassermann, Kahn, and Proske tests in pinta patients. Promising results have been obtained in studies of the therapeutic effect of mapharsen, penicillin, streptomycin, and aureomycin on pinta.

The incidence of intestinal protozoa was studied for the first time in Mexico in relation to infant diarrhea. The first case of infection by Isospora hominis in Mexico was reported, and the epidemiology of Balantidium coli infections was studied.

The characteristics of varieties of Plasmodium vivax from several parts of the country have been studied, verifying the Plasmodium preference for the reticulocytes in the blood as well as in the bone marrow. When P. gallinaceum was used, the possibility of oral infection was confirmed. For the first time in Mexico a methodical study of the Protozoa parasites of wild birds was carried out. The P. juxtanucleare, a chicken parasite in the state of Chiapas, was discovered. The value of chloroguanide (Paludrine) in the treatment of malaria has been assayed. Work on artificial fever was initiated, and study of experimental infection with Spirochaeta turicatae and on malariotherapy for neurosyphilis have been carried out using Mexican species of P. vivax. The institute provides the parasites for the treatment of neurosyphilis to many medical institutions and even to private physicians. An easy method of control of the malaria infection was established.

The geographic distribution of the Culicidae family has been widely studied, especially that of the Anapheles, correcting many errors in the literature in relation to Mexico. A new carrier of the P. gallinaceum was discovered, the Culex quinquefasciatus. The number of Anopheles species described in Mexico has increased considerably, including some described for the first time. On the border between Mexico and Guatemala the following species were found: albimanus, apicimacula, darlingi, gabaldoni, pseudopunctipennis, punctimacula, strodei, vestitipennis, and Chagasia banthanus.

Epidemiological data have been obtained, and some work has been done on leishmaniasis americana in Mexico. The biology and types of cultures have been studied, and a comparative cytological and immunologic study between the Mexican and South American species is being carried out.

Explorations continue in order to detect new cases of Chagas disease; Trypanosoma lewisi in rats has been investigated; Schizotripanum cruzi was found in one rat in Mexico City; two species of triatomas were found to be infested with Trypanosoma cruzi; and experimental infection of triatomas with large and small numbers of trypanosomas has been tried. Experiments on the transmission of Trypanosoma cruzi in several species of Ornithodoros have also been performed. The existence of Triatoma protacta woodi and Triatoma gerstaeckeri in Mexico was discovered; attempts were made at crossmatching Triatoma hegneri with Triatoma dimidiata and the collection of triatomides continues in different parts of the country in order to determine what species exist in Mexico and their geographic distribution. Similar studies are in process in relation to Ornithodorus species, specially Ornithodorus furcosus. A new species of Ornithodorus was discovered and was named O. drigesi.

The existence of microfilaria ozzardi in Mexico was proved, and an outbreak in the state of Campeche is being studied. Hetrazan (1-diethylcarbamyl-4-methyl piperazine dihydrogen citrate) was tried in patients with this filariasis. It seems to have no effect on such filaria.

The effect of Hetrazan in onchocercosis was studied experimentally. In a group of patients observed for over a year, it was found that the drug improved noticeably the ocular disturbances and reduced the number of microfilarias.

Thousands of Simulium flies have been identified. Sixty new species have been found, with three genera and eight subgenera. Five of the new species were found in the onchocercosic zone of Chiapas and Oaxaca. Many species of larvae were studied and codified. The material already known was also reviewed and classified. The transmission of Onchocerca volvulus by the Simulium mangabeirai was studied, and a sample of Simulium exiguun was found to be infected.

Many classifications of Simulium flies have been made (by the institute) not only in Mexico but also in the British Museum, the National Health Institute of Caracas, Venezuela, the University of California, the School of Tropical Medicine of San Juan, Puerto Rico, and other institutions. Also in this matters the institute receives consultation and has an exchange with institutions or persons from Canada, the United States, Brazil, Colombia, Guatemala, and French Guiana.

Since the foundation of the institute, work has been done constantly on helminthology, investigating the incidence of the different parasites in man and animals. Much data on cisticercosis has been collected.

Investigations on oxyuriasis have been carried out in thousands of children and adults in Mexico City and other parts of the country. The presence of Enterobius vermicularis has been investigated in the perianal and vulvar regions. In many cases other helminthic eggs have been found. The importance of repeated stool examinations has been emphasized, and a comparative study between the Hall and Graham techniques for the diagnosis of oxyguriasis has been done.

Trichinosis in muscles was investigated by the digestion method in 1,000 human diaphragms in Mexico City and in another 1,000 subjects by the Bachman test.

The institute has held a very important place in the field of mycology. Since the beginning the mycology laboratory has tried to determine which of the mycoses exist in Mexico. The Actinomyces of the actinomycotic mycetoma were studied experimentally in laboratory animals and under the electronic microscope. Cultures were made in chicken embryos. It was determined which fungi infected humans and which laboratory animals are the best for experimental infection.

It was found that 90% of cases of actinomycosis in Mexico are caused by Nocardia mexicana. Less frequent are Actinomyces madurae and A. pelletieri. In study of Actinomyces under the electronic microscope, it was found that the acid-fast Actinomyces have a thin capsule similar to that of the Mycobacterium tuberculosis. By cultures in chick embryos, frank differences were found between the acid-fast and non-acid-fast Actinomyces. The work carried out suggests that the Actinomyces mexicanus is the same as the Actinomyces braziliensis, the most important species in Brazil. Maduromycotic mycetoma has also been found in Mexico, although it is rare in comparison to actinomycosis. It is caused by a Cephalosporium.

Since 1941 the existence of chromoblastomycosis in Mexico was indicated, after culture of Hormodendrum pedrosoi in a case described by the institute as probably a case of dermatitis verrucosa.

In a series of publications, the dermatophytes causing tinea of the scalp, skin, and nails were described, identifying species epilans, sabourandi, and sulfureum with T. tonsurans.

Sporotrichosis has also been studied, and an antigen for diagnosis has been elaborated from the hydrocarbonated fraction of the Sporotrichum sckenkii; this antigen used for intradermal tests substitutes the culture for the diagnosis of sporotrichosis. This test has been adopted in the majority of the medical institutions in Mexico and some in the United States.

Several antagonists have been isolated for the most important pathogenic fungi: Cryptococcus neoformas, Blastomyces dermatitides, and Nocardia brasiliensis. Means of utilizing these species like antibiotic substances against mycosis are being studied. It was found that streptomycin is less efficient than penicillin in the treatment of infections caused by Actinomyces bovis. Actidione showed an inhibiting effect on yeast-like fungi, and is therefore useful in the treatment of cryptococcosis and moniliasis. Among the chemical products studied, a combination of sulfanilamides and copper showed a specific effect against N. brasiliensis, the agent causing actinomycotic mycetoma in Mexico, for which no treatment was known.

NORWAY

Tuberculosis in the Armed Services.—Reports on tuberculosis in the services continue to show how difficult it is to avoid an outbreak of tuberculosis in men on active duty, however impressive modern methods for combating tuberculosis may appear on paper. In an article on tuberculosis in the fighting services in 1949-1950, published in the organ of the Norwegian Medical Association, *Tidsskrift for den norske laegeforening*, for May 1, 1953, Dr. Herman Höst admits that during the postwar years tuberculosis has proved to be the most serious medical problem confronting the authorities. During the five year period 1947-1952, a total of 3,046 servicemen received compensation for disease contracted in the service, tuberculosis being responsible in 1,337 of these cases (43.9%). But it is encouraging to note that expenditure in this field has shown a sharp decline, for about 1,100,000 kroner were paid to 335 patients with tuberculosis in the budget year 1947-1948, whereas for the budget year 1951-1952 only about 440,000 kroner were distributed among 120 such patients. Since March, 1951, provision has been made for the tuberculin testing, before they are called up, of all who are liable for military service, the background of this measure being the law of 1947 providing for tuberculin testing and compulsory vaccination with BCG. Exemption from such vaccination can, however, be claimed by persons who continue to be tuberculin-negative after repeated vaccinations. During service in the armed forces mass radiography is repeated every third month, negative reactors being retested with tuberculin at the same intervals. Provision is also made for a search for tuberculosis in the home environment of the men found to be tuberculous while on active duty.

In his discussion of the merits of the various diagnostic tests of tuberculosis, Dr. Höst points out the shortcomings of both mass radiography and an ordinary clinical examination. Faith in the former is apt to render the latter somewhat perfunctory, and the former certainly requires technical skill and first-class equipment. Among 680 men found to be tuberculosis-suspect, there were as many as 141 who proved on closer observation to be nontuberculous, nonspecific pulmonary infiltrations being the commonest source of error. A leading article in the same number of the journal stresses the importance of linking up the different tuberculosis tests in such a way that their findings can be made available promptly and translated into action. It is urged that BCG vaccination should be followed by tuberculin control long before recruits are called up.

Care of Mental Defectives.—Substantial advances have been made in Norway with regard to the care of mental defectives since the end of World War II, when there were only three establishments for their care, with a total of 495 beds. By March 1, 1952, this number had risen to 1,115 distributed over 23 establishments approved officially. These establishments are in two cases state owned, with 446 beds, and in two others municipal owned, with 70 beds, the remainder being owned by voluntary health organizations or private persons. This combination of state and private activities in the approach of a social problem is typical of what happens in Norway in many other spheres, and in its planning for the future the government makes a point of encouraging private enterprise as a much valued corollary to its own doings. In the spring of 1952 the Norwegian Parliament endorsed a plan devised by the Department for Social Affairs for dealing with mental defectives. The number of low grade mental defectives incapable of benefiting from special educational facilities for mental defectives of higher grades can hardly be under 10,000 to 11,000. It is calculated that 6,500 beds are needed in homes for mental defectives, at the rate of about 2 per 1,000 of the population, but this figure must at present be regarded as out of reach, and the government's plan provides for only 5,200 beds. These are to be filled as rationally as possible, the mental defectives who cannot be accommodated in these beds being provided for in private homes and families, day homes, or the like. The 5,200 beds will, for the most part, be distributed among seven large regional establishments, each with several hundred beds and catering to communities with a population of about 500,000 to 600,000. Each of these regional establishments is to be composed of a series of smaller units devoted to some special function. These establishments are to be responsible for the care not only of mental defectives within their gates but also of those in smaller establishments in the neighborhood, including private homes and families. These subsidiary centers will include homes for the aged, a tuberculosis department, and quarters for children under 10. Since the war the government has concentrated on extending and modernizing its two original large establishments, on the assumption that the provision of smaller units such as day homes belongs to the sphere of private enterprise. There is much to be said in favor of more or less autonomous units whose administration provides scope for local enterprise.

Deaths of Dr. Karen Margrethe Simonsen Eek and Dr. Axel Scheel.—Born in Denmark on June 5, 1903, Dr. Simonsen received her medical training in Copenhagen and spent the first three years of her medical career in Danish provincial hospitals. Mental disease in children attracted her attention early, and her thesis for the degree of doctor of medicine was largely concerned with the psychic handicap of children reared in institutions where cleanliness and an adequate supply of vitamins do not compensate for a lack of personal care and love. Her studies abroad, including the United States, were largely concerned with the psychiatric problems of adults and children, but she did not neglect to equip herself with experience in somatic disease. Her appointments at the Rigshospital in Copenhagen led up to her becoming first assistant physician to the newly created children's wing of the psychiatric department. To further her experience, she began private practice in child psychiatry in Copenhagen. A few months later she was invited to take charge of the recently created department of child psychiatry at the Rikshospital in Oslo. Here she concentrated her efforts, determined to live and work as a native of the country of her adoption. In the summer of 1951, she married the Norwegian radiologist Dr. Sigurd Eek. She also adopted two boys. Her singularly serene personality created an atmosphere in her department that children and even adults were quick to sense and appreciate, and the cordiality of her staff reflected the spirit infused by this quiet, middle-aged woman whose death on May 13, 1953, means an irreparable loss to child psychiatry in Norway.

Dr. Axel Scheel, who died in May, 1953, at the age of 47 after about a half year's illness, came of medical stock, both his father and his grandfather having made their mark as physicians in Norway. His father was responsible, with Dr. Heimbeck, for the introduction of BCG vaccination in Norway. His son Axel qualified as a physician in 1932. After holding various hospital appointments, he began in 1936 to specialize as a radiologist, and from that time on he published several important works on his subject. Like many other patriotic Norwegians he worked abroad during the German occupation of Norway. From 1946 to 1950 he was in charge of the radiological department of the Aker's Hospital, and in 1950 he took charge of the radiological department of the Norwegian Radium Hospital. His doctorate thesis in 1946 was concerned with tuberculosis of the bones.

SWEDEN

Syphilis in Would-Be Blood Donors.—In the spring of 1952 the Swedish Red Cross organized a drive for blood donors in the County of Malmöhus, with the result that 5,908 new donors were registered. Among them were 4,009 who were willing to serve not only in wartime but also in peacetime. The typing of these prospective donors was undertaken at the blood donor center of the Malmö Hospital, while the pathological-bacteriological department of the same hospital undertook the search for cases of syphilis. In *Svenska läkartidningen* for April 17, 1953, Dr. Bengt Willert and Dr. Sten Winblad have published their findings of 5,668 would-be donors and their experiences with regard to the elimination

of persons with syphilis from among them. After the first 460 examinations had been carried out with Meinicke's reagent for screen testing, it became evident that this was not enough by itself. In addition to this test, a complement fixation test with cardiolipin as antigen was carried out, and, in doubtful cases, multiple tests were carried out next day with Meinicke's, Kahn's, and complement fixation tests. Altogether, 5,636 samples of blood were examined for syphilis. A slight Meinicke reaction was observed in 145 cases and a definitely positive Meinicke reaction in 54 cases. Thirteen persons had a positive Wassermann reaction, but there were only eight cases (1.4 per thousand) in which the reaction was positive to all three tests, Wassermann, Meinicke, and Kahn. There were five cases in which the Wassermann test was positive, while the other tests were negative. Dr. Willert and Dr. Winblad have come to the conclusion that in searching for syphilis among prospective blood donors, screening with only one test is not sufficient for the purpose. At least two tests are needed, and one of them should be a complement fixation test according to the Wassermann technique.

Licorice Therapy in Cases of Gastric Ulcer.—At the surgical department of the Sollefteå Hospital large doses of licorice have been given to a score of patients suffering from gastric and duodenal ulcer. Reporting on this treatment in *Svenska läkartidningen* for April 10, 1953, Dr. B. Gylling points out that the introduction of licorice therapy of gastric ulcer comes from a small town in Holland, where a patent medicine containing licorice became such a success that licorice came to be seriously studied as a remedy for gastric ulcer. Dr. Gylling's patients were, for the most part, so ill that surgery was indicated, and the drug was given (about 55 gm. daily) finely powdered and suspended in water, one mouthful every hour of the day for one to three weeks. The patients with duodenal ulcer did not respond as quickly to this treatment as those with gastric ulcer, who usually showed rapid improvement. But some of the patients did not tolerate this treatment well and requested its discontinuation, having experienced no relief, Dr. Gylling writes: "We have been unable to discover any remarkable healing of an ulcer in comparison with the time taken for an ordinary ulcer cure to effect recovery."

One of Dr. Gylling's patients was remarkably instructive with regard to her reaction from time to time to this therapy. She was a nurse, aged 52, with a history of gastric symptoms for more than 15 years and radiologically demonstrable gastric ulcer. Her symptoms vanished after only one day's treatment, and she was well satisfied with the response to it during the next five to six weeks, after which headache and severe edema of the face developed. These symptoms disappeared promptly when the drug was withheld, but the ulcer symptoms returned two months later. The licorice therapy was resumed, the ulcer symptoms disappeared, and a week later the edema and headache returned. The same cycle of reactions followed.

TURKEY

Recovery After Pneumonectomy for Lung Cancer.—In *Anadolu Kliniği,* Istanbul periodical, Recai Ergüder, professor of the second surgery clinic of the Gülhane Military Medical Academy Hospital, and his senior assistant, Dr. Orhan Bumin, described the clinical manifestations and diagnostic procedures of carcinoma of the lung. After a brief description of the first case in which surgical treatment has been successful in Turkey, they discussed the technique of pneumonectomy, the operative mortality, and the five year recovery rate. The patient, a 50-year-old military officer, had influenza for two weeks but had not fully recovered when he returned to duty. After three days the cough increased, pain developed in the back, his temperature rose to 39 C, and the patient was admitted to the hospital. He was weak, had no appetite, and had an audible wheezing cough of 20 days' duration. His father had died of cancer of the tongue. The patient himself had not had any serious illness. For 30 years he had smoked a pack of cigarettes daily, but he had never used alcohol. From time to time he had had mild bronchitis and, as a result of his smoking, a cough with expectoration in the mornings. On admission to the hospital the patient had an elevation of temperature that continued for 20 days, reaching 39.8 C. Results of urinalysis and the blood chemistry were normal. The leukocyte count was 22,000, and the erythrocyte sedimentation rate during the first day was 45 mm. per hour and subsequently attained 123 mm. A histoplasmin test and sputum test for tuberculosis bacilli were negative. Clinical and radiological examination and bronchoscopy revealed vegetation and an easily bleeding tumor on the bronchi leading to the upper lobe of the left lung. Histological examination of the material obtained by bronchial aspiration confirmed the diagnosis of cancer. In preparation for the operation the patient was given penicillin and vitamins B and C. During the operation the patient was transfused with 2,000 cc. of blood. Nitrous oxide, ether, and oxygen anesthesia was used. After pneumonectomy had been performed, the left pleural cavity was flushed with penicillin and streptomycin and, as recommended by Bailey of the United States, a temporary tracheotomy was performed to insure proper aspiration of the bronchi. The patient was given oxygen continuously. On the third day the tracheotomy tube was removed and the incision closed. Several roentgenograms made three days after the operation revealed that over the center of the mediastinum fluid had collected in the left pleural cavity and that the diaphragm had risen. According to the report Prof. N. Eranil of the pathology department of the Ankara University medical faculty, the tumor was an oat cell carcinoma. The patient recovered within two months and returned to active duty.

Leprosy in Afghanistan.—In *Klinik,* Bursa Medical Society periodical, Prof. Halil Gürün, a Turkish physician and graduate of Istanbul University, who was in the service of the Afghanistan government for four years as chief of the Kabul Medical School department of dermatology, reports that leprosy (Hansen's disease) in that country is endemic and manifestly increasing. In the author's estimation there are 25,000 to 30,000 persons with leprosy in that country. All are without medical care and resort to home remedies as best as they can. Dr. Halil Gürün reports that 22 (0.16%) of 12,389 patients examined during 1949 at the dermatology outpatient clinic of the Kabul Medical School had leprosy. In 1950, 32 (0.17%) of 19,504 patients, in 1951, 57 (0.25%) of 22,419 patients, and in the first six months of 1952, 142 (0.43%) of 13,509 patients had leprosy. The majority of the patients had lepromas on the face, the extremities, the abdomen, and the thorax. Testicular and laryngeal lepromas, extreme malformation and perforation of the buccal and nasal cavities, and mutilation of the hands and feet have been observed. In all patients Hansen's bacilli were present in tissue and serologic tests were positive.

Besides persons from Kabul itself, patients had come from the villages at the border of Turkistan, Pakistan, and central and southern Afghanistan. There have been no patients from the far southwest regions. Of the 163 patients who in turn occupied the seven beds set aside for leprosy patients at the Kabul Medical School, the only place where chaulmoogra oil and sulfonamides are available, 6 were women and 7 were children. Three of the children were girls 7 to 11 years old, and four were boys 9 to 11 years old. The majority of the men were of military age. On discharge the patients were given disulfanilamide (Disulon) tablets. The clinical types of leprosy encountered among the 163 patients were the anesthetic in 54, mixed in 48, tubercular in 27, lepromatous in 29, and mutilating lepromatous in 5.

In August, 1952, the author accompanied Dr. S. Christiansen on a short tour of investigation sponsored by the World Health Organization. A mobile clinic and laboratory was opened in five villages in Hazaracat, a region long famous for its leper colonies. Of 314 persons examined, 2 had lepromatous leprosy, 3 had maculoanesthetic leprosy, and 6 had cicatrized atrophy, anesthetic thermoanalgesic plaques, poly-

adenopathy, and nasal mucosa ulcerations. Investigation at the Kabul laboratory revealed that 13 patients had Hansen's bacilli in tissue specimens.

After discussing the pitiful plight of persons with leprosy, the author concludes that ignorance, dire poverty, superstition, lack of medical care and medicaments, the inability of the government to remedy the situation because of insufficient medical personnel, the absence of funds for medicaments and an insufficient health budget, which is not even enough to contend with tuberculosis, malaria, syphilis, trachoma and parasitic diseases, and the seasonal epidemic are mainly responsible for the regrettable conditions. Outside assistance is urgently needed.

Spontaneous Rupture of Uterus.—Also in *Klinik* Dr. Arif Sözen, chief of the Bursa Maternity Hospital and his associate, Dr. Mehmet Yurdabag, reported a case of spontaneous rupture of the uterus. The 38-year-old patient had had seven normal deliveries. Fifteen hours before the eighth delivery labor pains began, after seven hours the hand of the baby presented itself, and an hour later the labor pains ceased. When extreme pain in the abdomen followed, the patient was taken to the maternity hospital. On admission the patient was weak and pale, had a temperature of 36.7 C, and a pulse rate of 104. The abdomen was painful and swollen, on the left side the fetus was palpable, and on the right side the contractions of the uterus were evident. Then the right arm and shoulder and the umbilical cord presented itself, and there was a dark red secretion from the vagina. A cesarean section was performed, and the child was found among the intestines. The rupture, which had occurred on the left side of the uterus, was 8 cm. long, extending from the parametrium to the vagina. It was sutured and a supravaginal hysterectomy was performed. The abdomen was flushed with 2 million units of penicillin. For five days the patient was given 1,600,000 units of penicillin injections and 1 gm. of streptomycin. Recovery after two weeks was uneventful. Among the 5,200 deliveries at the Bursa Maternity Hospital, 16 (0.3%) uterine ruptures have been observed. According to the western medical literature, the incidence is from 0.12 to 0.3%.

Report on Leukemia.—In *Sağlik Dergisi,* the official periodical of the Ministry of Health and Social Assistance, Dr. Ihsan Aksan, chief of the Ankara General Hospital medical department, and his associate, Dr. Naci Arun, have published a report on 460 cases of blood diseases seen during a 10 year period. Of the 460 patients, 229 had hypochromic anemia, 66 splenic anemia, 60 hyperchromic anemia, 31 chronic myeloid leukemia, 18 hemorrhagic diathesis, 10 secondary thrombocytopenia, 9 chronic lymphoid leukemia, 7 lymphogranulomatosis, 6 acute myeloid leukemia, 6 acute lymphoid leukemia, 6 Banti's disease, 5 hemolytic anemia, 2 polcythemia, and 1 case each of essential thrombocytopenia, capillary toxicosis, pernicious anemia, hemophilic anemia, and achroacytosis (Mikulicz's disease). All the patients were males, and their ages ranged from 10 to over 60 years. Thirty-six had had malaria. Seven patients had typhoid, five pneumonia, three rheumatism, three icterus, one pleurisy, and one dysentery. None of the patients had had tuberculosis. In none of the cases was there a hereditary factor.

Thirty-nine patients had chronic and 13 acute leukemia. Of these, 34 patients had myeloid leukemia and 18 had lymphoid leukemia. The onset of acute cases resembled that of septicemia, with a temperature of 37.5 to 40 C, chills, aesthenia, sudden pallor, and in acute attacks hemorrhagic diathesis. The blood pressure of the 52 patients with leukemia was normal or subnormal. The sedimentation rate accelerated as anemia became more pronounced or other factors entered into the picture. The blood of all patients had a very high uric acid content. Because of the high protein metabolism, the basal metabolism was high in most of the patients with advanced myeloid and lymphoid leukemia, this was not so apparent in patients with aleukemia. Urinalysis revealed traces of albumin and a high uric acid content in all cases. When thrombocytes neared the danger zone a tendency to hemorrhage was observed. In some cases the cause of hemolytic anemia was not quite evident. In a great many cases, especially when the spleen was involved, the cause seemed to be the interaction of the erythroblastic reaction, erythropoiesis, erythrophagic histiocytes, and reticuloendothelial system.

During the initial stage in acute leukemia, the number of leukocytes per cubic millimeter was generally below 100,000; in four cases it was 3,000 to 10,000 and in five cases 38,000 to 76,000. In chronic leukemia the number of leukocytes per cubic millimeter was 100,000 to 800,000, with the whole series of myelocytes present. In acute cases mononuclear monocytes predominated, and in chronic cases all types of myeloblasts were found. Though the relation of the number of leukocytes to the severity or the duration of the disease was not definitely established, it was observed that in the final stages of a leukemia there was generally an increase in leukocytes. Predominance of mature forms indicated recovery.

A 19-year-old patient with a temperature of 38 C had been ill with rheumatism for three months. The pain in the joints had not subsided, and he perspired profusely during the night. Examination on his admission to the hospital revealed a painful and swollen left knee, enlarged lymph nodes on both sides of the neck, the clavicles, and axillas, a palpable spleen, and chronic tonsillitis. The patient had a temperature of 37.6 C, the pulse rate was 100, the sedimentation rate 18 to 40 mm., and the blood pressure 120/80 mm. Hg. There were 46,000 thrombocytes and 1% reticulocytes. The blood contained 8.66 mg. of total protein per 100 cc., with 4.88 mg. of albumin and 3.92 mg. of globulin. The blood examination revealed a hemoglobin level 70% of normal, 3 million red blood cells, and 10,000 white blood cells, 13% myeloblasts, 12% polymorphonuclears, 19% immature forms, and 56% lymphocytes. On the 9th day further enlargement of the spleen, the liver, and the lymph nodes became evident, and on the 11th day there was enlargement of the inguinal lymph nodes. The patient was given urethane in doses of 3 gm. daily for a total of in all 108 gm., but his condition did not improve and he died three months later. Twelve patients with myeloid and three patients with lymphoid leukemia were given urethane therapy. In eight of these patients the spleen and liver considerably decreased in size and the lymph nodes softened. One patient recovered so completely that he was inducted into the army on his discharge.

Antibiotic Effect of Chloramphenicol and Oxytetracycline.—In *Sağlik Dergisi,* journal of hygiene and the periodical of the Ministry of Health and Social Assistance, Dr. Mesut Okan, bacteriologist of Istanbul University Ziya Gün Foundation Research Institute, has published the results of his comparative investigation of the antibiotic effect of chloramphenicol (Chloromycetin) and oxytetracycline (Terramycin) on 15 saprophytic and pathogenic micro-organisms. The organisms included Staphylococcus aureus hemolyticus, Streptococcus longus hemolyticus, pneumococcus, Salmonella typhosus, S. paratyphi A, S. paratyphi B, Shigella paradysenteriae Flexner, Brucella melitensis, Bacillus anthracis, Escherichia coli, Aerobacter aerogenes, Proteus vulgaris, Pseudomonas aeruginosa, Candida albicans, and B. subtilis. A 1 cc. dilution of 5 and 2.5 mg. of chloramphenicol and oxytetracycline was used, and the result was observed for five hours. Except on the pneumococcus organism and the anthrax bacillus, chloramphenicol was more effective than oxytetracycline. Chloramphenicol proved especially effective on Eberth's bacillus (S. typhosa), but had very little effect on the paratyphoid B bacillus. On anthrax bacillus oxytetracycline proved very effective after only a few hours, but only half of the pneumococcus bacilli were dead after five hours. Whether 2.5 or 5 mg. of the antibiotic was used did not affect the result appreciably. When after 48 hours cultures were made on the part of the dish that had remained sterile, neither dead nor living organisms were obtained and new cultures also proved negative, indicating that the effect of these two antibiotics are bactericidal rather than bacteriostatic. When chloramphenicol was further diluted, the bactericidal result approached that of oxytetracycline.

THE LEISURE CORNER

MEDICAL STAMPS

In 1947 the Post Office Department of the United States issued a three cent stamp, reproducing Samuel Luke Fildes' "The Doctor," to commemorate the work of physicians as part of the celebration of the birth of the American Medical Association 100 years before. Recognition at this time of the physician's role in society, at least postagewise, was due in great measure to the growing awareness in many countries that medical men, medical events, and medical institutions are often fully as important as kings, queens, presidents, dictators, and generals. Actually, the number of postage stamps now commemorating medical and allied scientific achievements is so large that even the most ardent collector may be startled by the proportions of the field of medical philately. Because it is so extensive only a few aspects can be touched on in this article.

Sooner or later medical philately, if its pursuit is not to be haphazard and superficial, requires of the hobbyist a knowledge of medical history. The reason for this is that medical philately deals not only with medical portraiture, medical events, and medical mythology but also with medical buildings and institutions, stamps depicting diseases and medical botany, the Caduceus, the Red Cross, and Health Postal Taxes. In reality, there is as much room for specialization in medical philately as there is in the practice of medicine. For beginners a collection of medical portraits is probably the easiest to acquire, since many physicians have been commemorated both for their work in medicine and for their contributions and achievements in nonmedical fields.

There seems to have been no planned trend in the use of physicians' heads on postage stamps. In 1928, a famous physician's features greeted the addressee of almost every letter from Holland. The features were those of Hermann Boerhaave, who was born in 1668, and who became the first great clinical or "bedside" teacher. Until the 17th century there had been no systematic clinical teaching and all of the universities conferred medical degrees on the basis of a spoken disputation. Contact with patients was not required of medical novitiates and practitioners until Boerhaave instituted clinical teaching in 1701. In 1935 the Netherlands issued a six cent stamp depicting Frans Cornelis Donder, the famous Dutch ophthalmologist who was a notable contributor to physiological optics during the past century, introducing the use of prismatic and cylindrical lenses for the correction of certain types of eye defects and offering the first exact definitions of myopia and presbyopia.

In 1937 Austria paid homage to the old Vienna School of Medicine by placing the portraits of nine famous 19th century physicians on a series of stamps. These included Theodor Billroth, who was the founder of modern visceral surgery; Karl von Rokitansky, who performed more than 30,000 autopsies during his lifetime and who made voluminous contributions to the field of pathology; Ferdinand von Hebra, founder of the histological school of dermatology; Leopold Auenbrugger, discoverer of percussion as a diagnostic procedure; Joseph Skoda, whose name is given to the rale found in pneumonia; Carl Ferdinand von Arlt, whose treatises helped make ophthalmology an independent specialty; Theodor Meynert, an eminent neurologist and psychiatrist who made many investigations on the anatomy and physiology of the brain; Josef Hyrtl, who was the first great teacher of topographic and regional anatomy; and, finally, Gerhard van Swieten, founder of the old Vienna School of Medicine.

The likeness of Ignaz Philipp Semmelweis appeared on a Hungarian stamp in 1932 in honor of his epochal discovery of the value of antisepsis in obstetrics. This theory first met with considerable derision, but it was eventually accepted, enabling it to revolutionize the practice of obstetrics. Another brilliant investigator, whose portrait was reproduced on a postage stamp by Czechoslovakia in 1937 on the occasion of the 150th anniversary of his birth, was Johannes Evangelista Purkinje. He observed that fields of different color and equal brightness become unequally bright when illumination is decreased in brightness. To the layman, however, he is of interest chiefly because he established the permanent character of the fingerprint. The 19th century is known for the investigations of various pathologists, notably those of Louis Pasteur. In 1922, the 100th anniversary of the birth of Pasteur, the French government decreed that the three most used denominations of stamps would bear his profile, and this practice was continued for 10 years. Again, in 1936, a special set of stamps was issued to raise funds for impoverished French intellectuals, one of the stamps showing a three-quarter portrait of Pasteur holding a test tube.

Although some nations have dedicated postage stamps to physicians because of their medical accomplishments, others have memorialized them for achievement in other spheres of activity. In this connection, Germany has commemorated Johann Wolfgang von Goethe, the great 18th century poet who became interested in evolution and who was the first to use the term morphology, and Friedrich von Schiller, who spent so much time writing poetry while he was an army surgeon that he was arrested and condemned to write only medical treatises. Schiller escaped medicine by running off, thereafter devoting himself entirely to poetry, a field in which he acquired immortal fame.

Among "political truants" from medicine are physicians whose likenesses on stamps point to their ability as presidents of nations, high officials in government, or martyrs in the fight for freedom. To name a few, there are such notable American figures as William Henry Harrison, ninth president of the United States, who was a onetime pupil of Benjamin Rush, and Manasseh Cutler, honored on a United States stamp not so much because he was a good physician but because he was a good diplomat, lawyer, and minister of the gospel. Their appearances on postage stamps took place in 1938 and in 1937 respectively. Another medicopolitical figure, who once practiced medicine in New York and who later dominated French politics during World War I, was George Clemenceau, and still another was Sun Yat-sen, who became the first provisional president of China.

The medical history of the United States is replete with names of physicians who have achieved world fame. By means of the postage stamp knowledge of their accomplishments has been spread throughout the land. Among these doctors are Walter Reed, who headed a mission that eradicated yellow fever in the United States and West Indies, if not throughout the entire world; William C. Gorgas, who made the building of the Panama Canal feasible through the conquest of malaria and yellow fever; and Crawford W. Long for his pioneering with ether as an anesthetic. At the present time American postal authorities are believed to be considering a series of stamps honoring distinguished American medical men. Although as yet there is no intimation from official sources as to the time the stamps will appear or if they will be issued at all, the physicians nominated for the proposed series include, among others, William Beaumont, whose investigations on the digestive process have been hailed by some as America's greatest contribution to experimental physiology; Joseph Goldberger, a pioneer in vitamin research and responsible for the discovery that pellagra is caused by diet deficiencies; William Stewart Halsted, first surgeon to use rubber gloves and a pioneer in the use of local anesthesia; Oliver Wendell Holmes, poet, essayist and critic, who was one of the first to recognize the contagious nature of puerperal fever; William Henry Welch, pathologist and bacteriologist who helped found the Johns Hopkins Medical School; William Osler, whose textbook on medicine is still a standard; Ephraim McDowell, who performed the first ovariotomy; James Marion Sims, father of gynecology; and Howard T. Ricketts, the pathologist who demonstrated the transmission of Rocky Mountain spotted fever by ticks and typhus by lice.

One of the earliest European countries to recognize the achievements of the nursing profession philatelically was Romania. In 1906 a stamp appeared that showed Queen Elizabeth as a nurse administering to a wounded soldier. The message beneath the Queen's handwriting read, "Wounds are dressed and tears are wiped away." In 1925, stamps issued by Luxembourg depicted a nurse applying medication to the brow

of an obviously appreciative male patient. In 1921, Jugoslavia issued semipostal stamps for the benefit of invalid soldiers. One of these portrayed a nurse giving succor to a wounded soldier. On the occasion of the 75th anniversary of the Red Cross movement, a number of countries commemorated the event in stamps. France and Belgium included in their commemorative set a portrait of Florence Nightingale, founder of modern nursing as we know it today.

For the avid medical philatelist there are a number of specialties coming under the general heading "Medical Stamps" that are sufficiently complicated to challenge his ingenuity. Thus, for example, the specialty of the doctor portrayed can be used to establish subclassifications of groups such as surgeons, internists, ophthalmologists, histologists, and bacteriologists. Moreover, a number of geographical features have been named for the medical great, and medical events have been the basis for several commemorative issues. Then, there are stamps dealing with medical mythology, medical buildings and sanitoriums, medical botany and pharmacology, and diseases. All in all, the joys of medical philately are endless, providing both pleasure and education in medical history for those who are drawn to the world of stamps.

BUREAU OF MEDICAL ECONOMIC RESEARCH

For several years the Bureau of Medical Economic Research has presented in THE JOURNAL *an annual summary of the Consumers' Price Index and the medical care portions thereof. Since the Bureau of Labor Statistics of the United States Department of Labor is in the process of shifting to a new and enlarged price index, this article should be regarded as the transition or "changeover" article in this series. As such, this article is of unusual value to physicians interested in the entire series of articles.*—ED.

OLD AND NEW BASE PERIODS FOR MEDICAL CARE PRICE INDEXES

Frank G. Dickinson, Ph.D.

During World War I, a price index for consumers was developed by the Bureau of Labor Statistics of the United States Department of Labor to provide data that could be used in making wartime wage adjustments. In 1940, the Consumers' Price Index, sometimes erroneously called the "Cost-of-Living" Index, was revised, the coverage was broadened, and 1935-1939 = 100 was selected as the base period. The historic purpose of the Index has been to present a summary measure of price changes for consumers in the United States. Over the years, it has been an important tool for analyzing economic trends, and it has been used widely in recent years in collective bargaining agreements as a basis for automatic wage adjustments.

This Index is being overhauled again. A brief description of the three indexes currently available, in the chronological order of their development, will help to explain the transition. After this transition period is completed only the revised index will be published regularly.

Unadjusted Index.—This index was used before the adjusted series was developed. Its base period is 1935-1939, and all the breakdowns are available for the period from 1940 to June, 1953, although final annual averages for the sections are not yet available for 1952. This index was discontinued in June, 1953, and would have been discontinued in December, 1952, if a presidential directive requesting that it be continued for six more months had not been issued.

Adjusted Index.—This index is available for 1952 on both the old base period, 1935-1939, and the new base period, 1947-1949. It was originally computed only for 1951 and 1952 on the old base period. Later it was extended back to cover 1950 and, in fact, has been extended back to 1940; the breakdowns were carried back to 1940 only for rent and transportation. The differences between the adjusted and unadjusted indexes for any month, quarter, or year are very small except in some sections of the Index, e. g., transportation. Unfortunately, the annual indexes for 1952 have not been published for the sections of this Index, although the average for the entire Index has been published.

Revised Index.—This index started in 1953 on the 1947-1949 base only. (We shall avoid the temptation to call this the "new index" because the term "revised" is preferred.) Approximately 100 additional items are covered. For some months to come only one composite figure will be available for medical care, but eventually indexes for each of the medical care items will be published when this busy transition period for the staff of the Bureau of Labor Statistics ends.

Our major emphasis is on the effects of shifting the base period from 1935-1939 to 1947-1949, using the adjusted indexes. No figures for the revised indexes will be presented, and the only use of the unadjusted indexes (on the old base) will be in computing averages for the breakdowns for the new base period, 1947-1949. As noted already, after this transition period is over, only the revised index will be published.

TABLE 1.—*Consumers' Price Index and Indexes for Medical Care for Moderate-Income Families in Large Cities for 1951-1952 (1935-1939 = 100)*

Adjusted Indexes	1950 (1)	1951 (2)	1952 (3)
Consumers' Price Index	171.9	185.6	189.7*
Medical care and drugs	147.9	155.0	164.2
I. Medical care, excluding drugs	153.1	160.9	171.8
A. Physicians' fees (general practitioner, surgeon, specialist)	140.0	145.2	152.2
1. General practitioners' fees	139.8	145.2	152.4
(a) Office visit	140.9	146.0	152.4
(b) House visit	133.9	138.3	143.0
(c) Obstetric case	157.3	167.3	185.6
2. Surgeons' and specialists' fees	140.6	144.3	150.4
(a) Appendectomy, adult	137.4	141.6	148.0
(b) Tonsillectomy, child	144.0	147.2	153.1
B. Dentists' fees	154.3	160.0	163.8
1. Fillings	154.5	159.5	164.1
2. Extractions	156.9	164.5	166.4
C. Optometrists' fees, eyeglasses	128.9	134.6	136.4
D. Hospital rates	235.3	260.7	288.8
1. Men's pay ward	265.5	297.2	331.8
2. Semiprivate room	229.6	253.6	278.7
3. Private room	213.7	233.7	257.4
E. Group hospitalization †	.....	103.1	117.8
II. Prescriptions and drugs	124.8	128.4	129.7
A. Prescriptions	140.7	147.7	149.6

* All other indexes in this column were computed by the author from published quarterly indexes.
† December, 1950 = 100.

1952 LEVELS

In 1952, the Consumers' Price Index (adjusted) rose 4.1 points, from 185.6 in 1951 to a peak of 189.7. The index of medical care and drugs, which is a small portion of the entire Index, rose from 155.0 to 164.2, a gain of 9.2 points. Although the medical care portion of the Consumers' Price Index rose twice as many points as the entire Index during 1952, the medical care portion was still 25.5 points lower (on the old base). Moreover, the index of medical care and drug prices increased 64.2% over that of the base period 1935-1939, while the entire Index increased 89.7%.

What changes have occurred in the indexes of the individual medical care items? As is shown in table 1, the index of medical care, excluding drugs, was 171.8 in 1952 (row I), and the index of prescriptions and drugs was 129.7 (row II). The index of physicians' fees (general practitioner, surgeon, and specialist) was 152.2 (row IA); general practitioners' fees, 152.4, and surgeons' and specialists' fees, 150.4. With the exception of prescriptions and drugs, 129.7, optometrists' fees, 136.4, and dentists' fees, 163.8, all the items of the 1952 medical care index increased more points above 1951 than the entire Consumers' Price Index. The rise in the entire Consumers' Price Index from 1950 to 1952, 17.8 points, was larger, however, than the rise in the medical care index, 16.3 points. In other words, over this two year period, which reflects the inflationary influences of the Korean conflict, the medical

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care index and the Consumers' Price Index have increased approximately the same number of index points. Durable consumer goods and food are particularly responsive to wartime uncertainties and, as they comprise a major portion of the Index, strongly influence the rapid increase (13.7 points) of the entire Index in 1951 and the much slower increase (4.1 points) in 1952 after the initial adjustments were completed. Medical care prices tended to rise more steadily over this period (7.1 points in 1951 and 9.2 points in 1952); these prices were, of course, less affected by the Korean situation.

The hospital portion of the medical care index registered by far the greatest increase of the medical care items. This increase of 28.1 points is considerably larger than the increase of 4.1 points in the Consumers' Price Index and the increase of 9.2 points in the portion of the index for medical care and drugs, of which it has been the most inflationary part. As we have previously stated, hospitals are buyers of large quantities of food and labor; they feel currently the full impact of inflationary forces. Since the base period, the increased costs of labor, food, and materials, combined with a shorter working day for nurses, are among the major factors forcing the upward adjustment in hospital room rates. It may be pointed out in passing that, while hospital room rates have increased, the average length of stay in the hospital has decreased so that the cost of hospital care for some illnesses is actually less than it was in 1935-1939. If the hospital items were excluded from medical care, however, the index for medical care would have been considerably lower than 164.2 in 1952.

The index of hospital rates excludes the prices of laboratory and other services and is based on room rates only; the index of prescriptions and drugs does not include the new "wonder drugs." Realizing the necessity for adding such items, among many others, and for reflecting certain population changes, a thorough revision of this price index series was undertaken. Beginning in January, 1953, as a result of a comprehensive revision started by the Bureau of Labor Statistics in 1949, the Consumers' Price Index acquired a "new look." There is much evidence that consumers today are buying more and buying differently than they did in the 1930's. This revision was needed, therefore, to make the Index a more realistic measure of changes in consumers' prices in the 1950's.

SHIFTING THE BASE PERIOD

In addition to the revisions, a new base period, 1947-1949 = 100, replaced the old base period, 1935-1939 = 100, for each item as well as for the Index itself. The revisions could have been made without changing the base period. The purpose of table 2 is to show the effect of merely shifting the base. On the old base, the Consumers' Price Index for 1947, 1948, and 1949 was 159.6, 171.9, and 170.2; the average for these three years was 167.2. Setting this average equal to 100 obviously depresses the index points for 1950, 1951, and 1952 to about 60% (0.598, col. 2) of the levels on the old base. Consider the case for 1951 for which all the index numbers have been published. On the old base, the Index was 185.6, and, on the new base, it was only 111.0 (185.6 divided by 167.2 equals 1.110). How does this change in the base period affect the medical care portion of the Consumers' Price Index? On the old base, the medical care indexes for 1947, 1948, and 1949 were 131.6, 140.1, and 144.9—an average of 138.9, considerably lower than the 167.2 average for these three years for the entire Consumers' Price Index. Setting 138.9 equal to 100 depresses the values of the medical care items for 1950, 1951, and 1952 to about 72% (0.720, col. 2). The medical care portion of the Index stood at 155.0 in 1951 on the old base; this index becomes 111.1 (155.0 divided by 138.9 equals 1.116) on the new base. (The published figure is 111.1, not 111.6; the small difference could be due to rounding errors, changing weights, or the new influence of "group hospitalization.") In other words, both the medical care portion and the entire Consumers' Price Index were 11% higher in 1951 than in 1947-1949. It should also be noted in table 2 that shifting the base raises the index for physicians' fees in 1952 from being below the entire Index (152.2 and 189.7) to being practically on a par with it (113.2 and 113.5). This is even more noticeable for one of the five fees, obstetric case. Within the medical care field, the effects of base shifting vary greatly. Since the conversion factor for hospital rates, 0.487, is much smaller than for any other major subdivision of medical care and drugs, the index of hospital rates is depressed most by the shift to the new base period.

Shifting the base is a procedure that statisticians avoid in using published index numbers. In this case, the base shifting depresses the entire Index to 60% of the level on the old base and the medical care portion to only 72%. Now that the originator of the Index, the Bureau of Labor Statistics, has shifted the base (altered the weights and broadened the coverage), one is justified in pointing out that both the entire Index and the medical care portion thereof stood at 111 in 1951. In 1952, however, the medical care portion was 118.2 (estimated) as compared with only 113.5 for the entire Index; in 1950, also, the medical portion was higher, 106.0 and 102.8.

Medical care is not the only portion of the Index whose position relative to the entire Index was reversed by the shifting of the base period. Selected items are shown in table 3. The indexes for rent in 1947, 1948, and 1949 averaged 120.4. In 1951, the index for rent, 136.2, was considerably lower

TABLE 2.—*Effects of Shifting the Base Period from 1935-1939 to 1947-1949*

Adjusted Indexes	1947-1949 Average Old Base (1)	Conversion Factor 100 ÷ Col. (1) (2)	1950 Old Base (3)	1950 New Base (4)	1951 Old Base (5)	1951 New Base (6)	1952 Old Base (7)	1952 New Base (8)
Consumers' Price Index	167.2	0.598	171.9	102.8*	185.6	111.0*	189.7*	113.5*
Medical care and drugs	138.9	0.720	147.9	106.5*	155.0	111.6	164.2	118.2
I. Medical care, excluding drugs	143.1	0.699	153.1	107.0	160.9	112.4	171.8	120.1
A. Physicians' fees (general practitioner, surgeon, specialist)	134.5	0.743	140.0	104.1	145.2	108.0	152.2	113.2
1. General practitioners' fees	134.4	0.744	139.8	104.0	145.2	108.0	152.4	113.4
(a) Office visit	135.8	0.736	140.9	103.8	146.0	107.5	152.4	112.2
(b) House visit	128.4	0.779	133.9	104.3	138.3	107.7	143.0	111.4
(c) Obstetric case	150.9	0.663	157.3	104.2	167.3	110.9	185.6	123.0
2. Surgeons' and specialists' fees	134.5	0.743	140.6	104.5	144.3	107.3	150.4	111.8
(a) Appendectomy, adult	131.8	0.759	137.4	104.2	141.6	107.4	148.0	112.3
(b) Tonsillectomy, child	137.4	0.728	144.0	104.8	147.2	107.1	153.1	111.4
B. Dentists' fees	144.3	0.693	154.3	106.9	160.0	110.9	163.8	113.5
1. Fillings	144.6	0.692	154.5	106.8	159.5	110.3	164.1	113.5
2. Extractions	146.2	0.684	156.9	107.3	164.5	112.5	160.4	113.8
C. Optometrists' fees, eyeglasses	123.3	0.811	128.9	104.5	134.6	109.2	136.4	110.6
D. Hospital rates	205.4	0.487	235.3	114.6	260.7	126.9	288.8	140.6
1. Men's pay ward	226.5	0.442	265.5	117.2	297.2	131.2	331.8	146.5
2. Semiprivate room	200.3	0.499	229.6	114.6	253.6	126.6	278.7	139.1
3. Private room	190.7	0.524	213.7	112.1	233.7	122.5	257.4	135.0
E. Group hospitalization †	.....	.....	.....	.....	103.1	.....	117.8	.....
II. Prescriptions and drugs	120.1	0.833	124.8	103.9	128.4	106.9	129.7	108.0
A. Prescriptions	131.6	0.760	140.7	106.9	147.7	112.2	149.6	113.7

* These are published indexes; all other indexes in column were computed by the author from published quarterly indexes.
† December, 1950 = 100.

than the 185.6 of the entire Consumers' Price Index on the old base. Shifting to the new base period, 1947-1949, the index for rent becomes 113.1 (136.2 divided by 120.4 equals 1.131), which is higher than the 111.0 of the entire Index. Conversely, in 1947, 1948, and 1949, the indexes for women's cotton housedresses averaged 291.7. In 1951, the index for women's cotton housedresses was 282.5, considerably higher than the 185.6 of the entire Index on the old base. On the new base period, however, this item becomes 96.8 (282.5 divided by 291.7 equals 0.968), much less than the 111.0 of the entire Consumers' Price Index. Upon observing this figure, one might infer that the price of cotton housedresses is now below "par" and that they are very reasonably priced; most housewives would contend that cotton housedresses are not reasonably priced, no matter what the shift in base indicates. The index for personal care (services of barbers and beauticians and for cosmetics) behaves in much the same fashion. In 1947, 1948, and 1949, the indexes for this portion of the Index averaged 174.2. In 1951, the index for personal care was 192.5; this was also higher than the 185.6 of the entire Index on the old base. Shifted to the new base, this index becomes 110.5 (192.5 divided by 174.2 equals 1.105), lower than the 111.0 of the entire Consumers' Price Index on the 1947-1949 base. Again the effect of shifting the base is to suggest that the prices of personal care items were at very reasonable levels in 1951. Are haircuts now reasonably priced?

These three examples illustrate the effects of the shift of the base period on index items that rose rapidly in price during the early years (before 1950) of the present inflationary movement, particularly during World War II. The shift in the base period makes these items appear in a favorable light to consumers by the process of concealing the high levels that they had attained by 1947-1949. It is highly probable that, after a few years of seeing indexes on the new base period, the general reader will forget the high levels attained in the base period and there will be a new generation of shoppers. Although the public will be misled, experienced statisticians will not; they may, in attempting to avoid confusion, refuse to use the new base period and shift those revised indexes, which can be so shifted, back to the old pre-inflationary base period, 1935-1939. This temptation will be great for medical economists because there is general agreement that physicians' fees are among the relatively static prices in a broad inflationary movement, and 1947-1949 was a very disturbed period. Fee schedules are largely established through custom and tend to remain relatively static even when the price of a bushel of wheat and of a pair of shoes doubles. A fee does not increase from $3.00 to $3.10 to $3.20; it is more likely to stay at $3.00 until a jump to $4.00 or $5.00 is warranted. Hence the index of fees would jump in any quarter in which the fees were increased in a large number of the 34 (or 46) cities. The index of obstetric fees is currently the highest of the five fees (table 2). A major explanation is the exceedingly large number of births during the years after World War II. More generally, the factors responsible for boosting the indexes of medical care items came late and slowly in the long inflationary period starting around 1940. Because the old base period coincides with the start of the "wonder drug" era studded with many other revolutionary changes in therapy, it is preferred in the field of medical care. On the other hand, 1947-1949 is a poor base period because medical demobilization was taking place. About two-fifths of the physicians were in military service in 1945. Many of them did not return directly to practice or to their prewar home towns. Medical demobilization featured the last three years of the 1940's. From the standpoint of medical economics, those three years were far too disturbed to be chosen as a base or normal period. The general case against it is, of course, our main point.

AN ANALOGY

An analogy may be helpful to the reader in reviewing the very different effects that the shifting of the base will have on different portions or items in the Index. Shifting the base from 1935-1939 to 1947-1949 may be likened to two men climbing a hill. One man, with a head start, has climbed two-thirds of the way up the hill; his companion, who started later and climbed more slowly, has climbed only one-third of the way up the hill. Stopping on a shelf, the first man turns to his companion and says, "We will stop where we are and, even though I have climbed higher than you have, we will call your position or elevation from the foot of the hill 100% and mine 100%." When both men reach the top of the hill, therefore, the first (upper) man's position will be 150% while his companion's position will be 300%, even though both have climbed to the top of the same hill.

Never before in the long history of measuring changes in prices paid by consumers has the Bureau of Labor Statistics shifted to a later base period during the course of an inflationary trend. The original base period, 1913, certainly did not represent such a period; nor did the 1935-1939 base that followed it.[1] On the contrary, this latter period was representative of a postdepression or prewar era. From this period, the base has been shifted to a period of post-World War II inflation, with consumers having saved dollars to spend for goods of wartime scarcity. (The sharp increase in births might possibly be considered a postwar spending spree in the realm of medical care.) A brief examination of the Index for 1950, 1951, and 1952 shows that this inflationary period that started before World War II was not terminated in 1949, making the new base period an interim station in the inflationary trend; a shelf on a hillside. It is difficult, therefore, for one who has watched the development of this Index and used it frequently in his studies to accept this shift. Although the arguments for overhauling the Index are strong, it seems to us and to many other economists that it was a mistake to also select a new base period before the inflationary forces had run their course. Apparently the new base period was selected by the Bureau of the Budget, and the Bureau of Labor Statistics was requested to use it in order that all major index numbers published by the various Federal agencies would have the same new base period. The necessity for such uniformity is open to question.

TABLE 3.—*Comparisons of Selected Items on the Old Base and the New Base*

Adjusted Indexes	1947-1949 Average Old Base (1)	1950 Old Base (2)	1950 New Base (3)	1951 Old Base (4)	1951 New Base (5)
Consumers' Price Index	167.2	171.9	102.8	185.6	111.0
All furniture	212.3	215.7	106.1	236.4	111.4
Food	202.0	210.2	101.2	227.4	112.6
Medical care	138.9	147.9	106.0*	155.0	111.1*
Men's street shoes	224.0	236.1	105.4	269.4	120.3
Personal care	174.2	176.6	101.1	192.5	110.5
Recreation	156.2	163.8	103.4	168.5	106.5
Rent	120.4	131.0	108.8	136.2	113.1
Transportation	144.6	162.2	111.3	173.2	118.4
Women's cotton housedresses	291.7	271.5	93.1	282.5	96.8

* Figures published by the Bureau of Labor Statistics; direct shifting of the base gives 106.5 in 1950 and 111.6 in 1951 for medical care.

OTHER CHANGES

There are other changes in addition to the shifting of the base period. Originally there were six major groups: food; apparel; rent; fuel, electricity, and refrigeration; house furnishings; and miscellaneous goods and services. In the revised index, rent, house furnishings, and fuel, electricity, and refrigeration are combined into one major group, housing. Medical care, personal care, transportation, and reading and recreation, which were formerly four subdivisions under miscellaneous goods and services, are now four major groups, bringing the total number of major groupings to eight. A slight revision in the medical care portion of the Index results from the addition of penicillin tablets, multiple vitamin concentrates, and other than nationally advertised aspirin to the drug and prescription items.

1. The old base period is five years and the new base period is three years. Consequently, the old base period is somewhat broader. This advantage is difficult to evaluate; three years could be a sufficiently long time for a good base period. Furthermore, there has been criticism of the 1935-1939 base period on the grounds that the after-effects of the depression of the first half of the 1930's were much greater on some commodities and services than on others. Ideally, a base period should be a period of time in which the interrelationships of prices are relatively free from abnormal influences.

Many new items are priced in other sections of the Index, raising the total number of items priced from about 200 in the adjusted (old) index to over 300 in the revised index. Thirty food items have been added, as well as a considerable number of articles of clothing, house furnishings, and miscellaneous goods and services. Direct measures of the effect of price change on the costs of home ownership and home maintenance are obtained for the first time, in addition to direct pricing of restaurant meals, used cars, and other items not priced in the past.

Another change that has been incorporated into the revision deals with the importance of each of the items that goes into the revised index "market basket," i. e., the "weight" assigned to each item. In the unadjusted index, spending patterns of wage earners' and clerical workers' families for 1934-1936 were used as a base for weighting, while the adjusted index reflects buying habits for 1950 and the revised index reflects buying habits in 1952. Population weights used in combining the city indexes into a revised (national) index (and into the adjusted national index) are based on the 1950 census rather than on the 1940 census that was used in the unadjusted (national) index. The list of cities in which prices are sampled has been increased from 34 to 46 and is now representative of all urban places ranging in size from very large cities to towns of 2,500 population, rather than large cities only. All of these desirable revisions and extensions probably could have been made without shifting the base period.

The unadjusted index will be issued through June, 1953, to facilitate the transition to the revised index for users of the Consumers' Price Index. After that date, the reversals created by shifting the base period cannot be so easily demonstrated; they should not be forgotten. The breakdown on individual medical care items will probably not be available soon, as no exact date for the release of individual medical care items of the revised index has yet been set. When this information becomes available, a complete analysis of the data on medical care will be made as soon as possible by the Bureau of Medical Economic Research. Unless our present thinking changes, that analysis will involve shifting the indexes back to the old base period. Our critical attitude toward the new base period will not, however, conceal the evidence that many medical care items, including hospital room rates, have risen faster than the entire Consumers' Price Index since 1947-1949.

BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACTS

Drunkenness: Admissibility in Evidence of Chemical Tests.—The defendant was convicted of causing death while operating an automobile under the influence of intoxicating liquor. From such conviction he appealed to the Supreme Court of Colorado.

After the accident, which gave rise to the prosecution, the defendant and the injured persons who were riding in the other automobile were removed to a hospital in Colorado Springs. A sample of the defendant's blood was taken, without objection, by a physician and thereafter analyzed by a registered medical technologist, with the result that it was found that the alcoholic content of his blood was "point two eight per cent. That is twenty-eight hundredths, or twenty-eight hundred milligrams per hundred cc.'s." The medical technologist further testified that "anything over one point five [sic] is considered under the influence of alcohol" and "would cause an impairment of his ability to drive." [Clearly what was meant was 0.15 not 1.5.] The highway patrolman who was at the scene of the accident and others who talked with the defendant after he was removed to the hospital, including the physician who attended him and took the sample of his blood, all testified that they detected the odor of liquor on his breath either at the time of the accident or shortly thereafter. The defendant contended that the admission of the testimony of the medical technologist was in error because of the following reasons: 1. It was incompetent. 2. It was violative of the defendant's constitutional rights and privileges.

The registered medical technologist, said the Supreme Court, was a college graduate and had had a year's special training at Toledo University, which is a school approved by the National Board of Registry. She had been employed at St. Francis' Hospital in Colorado Springs for about nine months, at Camp Carson near Colorado Springs for three and a half years, and at Memorial Hospital in Colorado Springs for a period of four and a half years, during all of which time she was engaged as a registered medical technologist, and her work involved blood and other analyses. She testified that in the analysis of the defendant's blood she used the Nicloux method, which is an accepted method of blood analysis. Her evidence was competent; its weight was for the jury's determination. There was testimony introduced on the defendant's behalf regarding the Nicloux method and its accuracy. Aside from any blood analysis, however, there was competent evidence sufficient to warrant the jury in determining that defendant, at the time of the accident, was driving under the influence of intoxicating liquor. Apart from the testimony of the registered medical technologist, the jury might properly have found the defendant guilty as charged. Neither we, nor the jury, the court continued, are sufficiently learned in the art of blood analysis to determine whether the Nicloux method or other of the methods to which defendant's physician testified is the better and more accurate method, but the weight to be given such testimony was a matter exclusively for the jury's determination, and we perceive no error in its reception.

Accordingly the conviction of the defendant was affirmed. *Kallnbach v. People, 242 P. (2d) 222 (Colorado, 1952).*

Taxes: Application of Social Security Taxes to Part-Time Industrial Physician.—This was an action by the Willard Battery Company to recover alleged overpayments of federal employment taxes on the salaries of part-time industrial physicians who examined and treated its employees. The case was heard in the United States district court for the northern district of Ohio, eastern division.

The contracts between the physicians and the plaintiff company, said the court, indicate that the rights and obligations of an employer-employee relationship were not being assumed. Professional services requiring a high degree of skill were contracted for, but direct control and supervision over the details and means by which the work was to be accomplished were not contemplated. The contracts provided that the physicians were to use such methods as they saw fit "in accordance with the best established practice." Under the contractual arrangements there was a mutual right to terminate. While the right to terminate might be construed to be a right of discharge (one of the indicia of an employer-employee relationship), such a construction of the provision here would not be realistic, because the parties were given the benefit of notice and there was no right to terminate immediately. The evidence shows that the physicians performed only part-time service for the plaintiff company. During the years in question, they maintained private practices, to which most of their time was devoted. They were free to leave the company premises even during the hours they were scheduled to work, if an emergency case in their private practice required their presence. The compensation they received from the company was only a fraction of their total incomes during the years in question.

One of the Treasury regulations as to who are employees provides: ". . . In general, if an individual is subject to the control or direction of another merely as to the result to be accomplished by the work and not as to the means and methods for accomplishing the result, he is an independent contractor. Generally, physicians, lawyers, dentists, veterinarians, contractors, subcontractors, public stenographers, auctioneers, and others *who follow an independent trade, business or profession,* in which they offer their services to the public, are independent contractors and not employees."

The court held that the plaintiff was entitled to a refund of the taxes it had paid. *Willard Storage Battery Co. v. Carey, Collector of Internal Revenue, 103 F. Supp. 7 (1952).*

MEDICAL LITERATURE ABSTRACTS

UNITED STATES

A.M.A. Arch. Ophthalmology, Chicago

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Roentgen-Ray Cataract: Effects of Shielding of Lens and Ciliary Body A. J. Alter and P. J. Leinfelder.—p. 257.
Meningiomas of Anterior Clinoid Process as a Cause of Unilateral Loss of Vision: Surgical Considerations. A. Uihlein and R. D. Weyand. —p. 261.
Depth of Focus and Amplitude of Accommodation Through Trifocal Glasses. P. W. Miles.—p. 271.
Glaucoma Following Occlusion of Central Retinal Artery. C. D. Benton Jr.—p. 280.
Histologic Appearance of an Eye Four Days After Cataract Extraction. G. B. Kara.—p. 285.
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Observations on Vertical Divergences and Hyperphorias. K. N. Ogle and A. deH. Prangen.—p. 313.
Structural Changes in Corneas of Guinea Pigs After Wearing Contact Lenses. G. K. Smelser and V. Ozanics.—p. 335.
Glaucoma Associated with Krukenberg's Spindle. R. S. Riffenburgh. —p. 341.
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A.M.A. Arch. Pathology, Chicago

55:257-356 (April) 1953

Acid Mucopolysaccharides of Aorta. C. H. Bunting and H. Bunting. —p. 257.
Effects of High Intensity Radiant Energy on Skin: I. Type of Injury and Its Relation to Energy Delivery Rate. G .E. Sheline, E. L. Alpen, P. R. Kuhl and A. J. Ahokas.—p. 265.
Id.: II. Quantitative Dependence of Tissue Injury on Duration of Exposure. E. L. Alpen, G. E. Sheline, P. R. Kuhl and A. J. Ahokas. —p. 280.
*Milk-Aspiration Pneumonia in Human and Animal Subjects. T. J. Moran. —p. 286.
Developmental Brain Metabolism: Effects of Cortisone, Anoxia Fluoroacetate, Radiation, Insulin, and Other Inhibitors on Embryo, Newborn, and Adult. S. P. Hicks.—p. 302.
Classification of Glandular Tumors of Salivary Glands: Study of One-Hundred Forty-Three Cases. W. H. Bauer and J. D. Bauer.—p. 328.
Localizing Properties of Anti-Rat-Kidney Serum Prepared in Ducks. D. Pressman, L. Korngold and W. Heymann.—p. 347.

Milk-Aspiration Pneumonia.—Autopsy studies on both infants and adults convinced Moran that pneumonia caused by aspiration of milk is commoner than most clinicians and pathologists realize. He found milk-aspiration pneumonia frequently in infants who had feeding problems due to prematurity, central nervous system defects, or obstruction of the esophagus. Aspiration of milk accounted for sudden death in one apparently healthy infant, 3 months old, who had been allowed to take his feeding mixture with his bottle propped against a pillow, without the mother's help. In adults this disease has been found most frequently in persons confined to bed, in elderly persons with impaired reflexes, and in mental patients. It may be found in association with pneumonias caused by liquid petrolatum or with the aspiration pneumonias produced by solid foods. It may result from direct aspiration of milk or from aspiration of vomitus containing milk. The pathological changes include acute pneumonia, abscess formation, focal and widespread granulomas, alveolar thickening, giant-cell reaction, and fibrosis. The reaction is usually mononuclear and granulomatous at the time of death. The author also studied the tissue reaction produced by intratracheal injection of varying amounts of feeding mixture, human milk, or cow's milk into rabbit lungs. A reaction to the milk occurred within a few minutes of the time of injection. Smears and sections of the bronchi showed numerous red blood cells, granulocytes, and macrophages. Occasional macrophages contained fat, apparently from the milk. Later reactions to injection of milk varied from acute pneumonia to focal and widespread granulomatous lesions with giant-cell reactions and fibrosis. Although some features of the disease both in human and in animal lungs resembled certain features of lipid pneumonia caused by liquid petrolatum or cod liver oil, the general reaction more closely resembled that seen in response to injection of solid foods. Because the response is to the milk protein as well as to the fat, the term milk-aspiration pneumonia more accurately describes this disease than terms such as lipid pneumonia caused by milk. Microscopic studies of the human and animal material suggest that many of the mononuclear pneumonias occurring in infants may be caused by aspiration of milk. The authors stress the need of instructing nursing personnel in feeding methods and general nursing care designed to eliminate the hazards of aspiration pneumonia.

American Journal of Medical Sciences, Philadelphia

225:349-468 (April) 1953

Viral Hepatitis. J. Stokes Jr.—p. 349.
*Bell's Palsy Treated with Cortisone. H. H. Rothendler.—p. 358.
Body Position in Relation to Venous Air Embolism and the Associated Cardiovascular-Respiratory Changes. M. J. Oppenheimer, T. M. Durant and P. Lynch.—p. 362.
Jet Injection of Radioisotopes: Clinical Study Comparing Needle and Jet Injection of I_{131}, K_{42}, and Na_{24}. F. K. Bauer, B. Cassen, E. Youtcheff and L. Shoop.—p. 374.
*Results with Oral Hexamethonium Alone and in Combination with 1-Hydrazinopathalazine (Apresoline) in Therapy of Hypertension. J. H. Moyer, H. B. Snyder, I. Johnson and others.—p. 379.
Inactivation of Antibiotics by Cation Exchange Resins. I. S. Friedman, S. Zuckerman and E. McCatty.—p. 399.
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Tetrazolium as an Aid to Study of Tubercle Bacilli. H. S. Willis, H. M. Vandiviere and W. H. Gentry.—p. 410.
Plasma Lipoprotein Changes Induced by Acute Local Cold Injury. L. J. Milch, R. F. Redmond, W. W. Calhoun and the Cardiovascular Research Group.—p. 416.
Reactivation of Pulmonary Tuberculosis in Relation to Subtotal Gastrectomy for Peptic Ulcer. T. A. Warthin.—p. 421.
Studies of Syphilis of Ear and Penicillin. P. Ittkin and M. J. Tamari. —p. 427.
Weber-Christian Syndrome. H. Beerman.—p. 446.

Cortisone in Treatment of Bell's Palsy.—In 1951 Rothendler reported on a patient with Bell's palsy in whom cortisone proved effective. He now presents the histories of seven patients, in six of whom Bell's palsy was successfully counteracted with cortisone. The author feels that the ability of cortisone to relieve the acute edema and inflammatory reaction of the facial nerve and its sheath, which cause marked compression of the nerve as it passes through the bony portion of the fallopian aqueduct, explains the efficacy of cortisone in peripheral paralysis of the facial nerve. This makes possible early restoration of nerve function. After atrophy has taken taken place, cortisone cannot be expected to have a beneficial effect. It is assumed that this explains the failure of cortisone treatment in the seventh patient, in whom cortisone was given only after a severe paralysis had been present for 10 days, during which time nerve atrophy, as indicated by faradic test, had taken place. This does not imply that the nerve will be atrophied in all cases after 10 days, since the degree of atrophy also depends on the severity of the inflammation. It should be emphasized, however, that cortisone

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Titles marked with an asterisk (*) are abstracted.

is not intended as a treatment of Bell's palsy of long standing. To produce the maximum effect promptly, large doses of cortisone were given initially. On the first day doses varied between 300 and 600 mg., being given in divided doses. In the first three cases the cortisone was injected intramuscularly, but the last four patients were given cortisone tablets by mouth.

Hexamethonium in Therapy of Hypertension.—A group of 58 unselected ambulatory patients with moderate to severe hypertension were given hexamethonium orally, and were followed for from 4 to 16 months. The dosage schedule must be individually adjusted for each patient, so that excessive hypotension and serious complications will be avoided. All but 11 of the 58 patients responded with a significant (more than 20 mm. Hg) decrease in blood pressure, and in about one-half of the patients the blood pressure in the upright position returned to normal. Patients with diastolic pressures above 140 mm. Hg required only slightly larger doses than did those with pressures between 100 and 120 mm. Hg. Patients with severe hypertension complicated by cardiac failure and renal disease seemed to be particularly resistant to therapy. Cerebrovascular disease and heart disease (cardiac failure and angina pectoris) seemed to be particularly benefited by a reduction in blood pressure with hexamethonium. Impaired renal function (even if uremia is present) is not a contraindication to hypotensive therapy. In the presence of renal damage, however, glomerular filtration is decreased and small changes may precipitate progressive renal failure; therefore in such cases reduction in blood pressure must be undertaken with extreme caution and with constant evaluation of renal excretory function. Any tendency toward an increase in blood urea nitrogen contraindicates further reduction in blood pressure. If close supervision and repeated evaluation of the blood urea nitrogen is not feasible, then therapy with hexamethonium is contraindicated. The administration of hydralazine (Apresoline) and hexamethonium in combination further improved the blood pressure regulation in 11 of 18 patients in whom adequate control was not obtained with hexamethonium alone. The authors conclude that hexamethonium chloride was superior to other orally active hypotensive agents used under similar circumstances.

American Journal of Psychiatry, New York

109:721-800 (April) 1953

Memory as Biological Function. R. P. Mackay.—p. 721.
Social Structure and Psychiatric Disorders. F. C. Redlich, A. B. Hollingshead, B. H. Roberts and others.—p. 729.
*Method and Results of Electric Convuslive Therapy During Complete Curarization, with Observations on Curare Antagonist, Tensilon. J. S. Gottlieb and L. E. Morris.—p. 735.
Preliminary Observations on Convulsive and Subconvulsive Treatments Induced by Intermittent Photic Stimulation. G. A. Ulett.—p. 741.
Comparative Study of Flaxedil and Syncurine Combined with Pentothal Anesthesia in Modifying Electroconvulsive Therapy. W. L. Holt Jr., D. Niswander, D. K. Ziegler and R. Turk.—p. 749.
Eosinophil Variation in Course of Insulin Coma Therapy. H. C. Shands and D. Menzer.—p. 757.
New Drugs in Treatment of Petit Mal Epilepsy. F. T. Zimmerman.—p. 767.
Psychiatric Service in General Hospital with Special Reference to Day Treatment Unit. A. E. Moll.—p. 774.
Psychiatric Progress in California. G. N. Thompson.—p. 777.

Use of Curare in Electric Convulsive Therapy.—Although electric convulsive therapy has been proved effective for patients with depression, the depressive disorders of aged patients are often complicated by cardiovascular, neural, and skeletal disabilities, which make convulsive therapy hazardous. Patients with osteoporosis or osteomalacia have heretofore usually been denied electric convulsive therapy, because of the danger of compression fractures, but Gottlieb and Morris reasoned that these patients might be protected by curare. They report on six elderly depressed patients with severe osteoporosis of the spine and other physical disabilities who were treated by electric convulsive therapy after having been given curare. The method requires the administration of sufficient amounts of curare to produce paralysis of the voluntary musculature. Since this removes the patient's ability to breathe, it is necessary that respiration be adequately supported at all times; the technique should therefore never be undertaken by anyone who is not an expert in the maintenance of artificial respiration. In the patients described use of curare protected severely diseased vertebrae from further injury. Two of the six patients were completely relieved of their depression; two were partially relieved and were able to return home; in one patient, who had a focal cerebrovascular lesion, status epilepticus developed; and one died suddenly. All six aged patients were poor risks for any procedure; in addition to the depression and the severe osteoporosis of the spine, they also had cardiovascular and/or cerebrovascular disorders. Thus use of curare made electric convulsive therapy possible for patients who otherwise would have been unable to receive it. Edrophonium (Tensilon), which has been introduced as an antagonist of curare, was found not to provide sufficient anticurare effect to overcome respiratory paralysis. The authors feel that no antagonist of curare should be solely relied upon to overcome respiratory arrest, but should be considered as ancillary to administration of oxygen for maintenance of proper ventilation.

Annals of Surgery, Philadelphia

137:433-576 (April) 1953. **Partial Index**

Experimental Observations of Concussion and Contusion of Spinal Cord. L. W. Freeman and T. W. Wright.—p. 433.
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Reduction of Mortality in Swine from Combined Total Body Radiation and Thermal Burns by Streptomycin. H. Baxter, J. A. Drummond, L. G. Stephens-Newsham and R. G. Randall.—p. 450.
*Exposure Treatment of Burns C. P. Artz, E. Reiss, J. H. Davis Jr. and W. H. Amspacher.—p. 456.
Carotid Body Tumors (Chemodectomas). J. R. Pettet, L. B. Woolner and E. S. Judd Jr.—p. 465.
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Surgical Treatment of Non-Neoplastic Lesions at the Esophago-Gastric Junction. W. A. Barnes and R. S. McElwee.—p. 523.
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Acute Massive Venous Occlusion of Lower Extremity. E. J. Halligan, J. L. Costello and T. F. Lewis.—p. 543.
*Method of Intestinal Anastomosis Without Use of Clamps. H. Berman and F. S. Mainella.—p. 548.
Aneurysm of Hepatic Artery—Cause of Obscure Abdominal Hemorrhage. W. O. Barnett and J. A. Wagner.—p. 561.
Repair of Surgical Abdominal Wall Defect with Pedicled Musculofascial Flap. G. J. Lesnick and A. M. Davids.—p. 569.

Exposure Treatment of Burns.—During the past three years over 300 patients with burns were treated by exposure to the air, with the patients placed in bed in the most comfortable position that completely exposed the affected areas. The successful application of this effective and practicable method of local care depends on the presence of hard crusts, formed chiefly from the exudate of partial thickness burns, and on the integrity of dry eschars composed of the dead skin of deep burns. The crusts and eschars serve as protection against infection; crusts desquamate when partial thickness burns are healed and eschars must be removed, preferably by excision, before full thickness burns are grafted. If fever, prolonged leukocytosis, suppuration, or any combination of these is taken as evidence of infection, 117 (77%) of the authors' 152 patients with partial thickness skin loss remained clinically free of infection at all times; minimal localized infection occurred in 26 patients (17%) and frank suppuration in only 9 (6%). As a result of their experience, the authors state that exposure to the air is indicated in all recent burns that can be completely exposed without undue difficulty or discomfort. Exposure is easily applied, but the configuration of some

burns may pose problems. Circumferential burns of the trunk cannot be adequately exposed. The outstanding advantage of the method consists in the effective control of infection in most patients. Deep dermal burns heal uneventfully under crusts, which protect the burn from mechanical and bacterial trauma. The method is potentially dangerous in that it may encourage inexperienced personnel to delay skin grafting. If very deep dermal burns fail to heal in 21 days, the covering of such burns should be removed and skin grafting applied. Granulating surfaces must never be exposed. Judiciously applied exposure is as good as other methods and, in certain types of burns, it is definitely superior. In the initial care of a burn, exposure eliminates the need for elaborate aseptic technique and for expensive dressing; it is easily taught and can be rapidly accomplished. These advantages are particularly impressive in preparation for a disaster when facilities for the proper application of dressings would probably not be available. Like all other forms of therapy, exposure to air demands careful attention to the body's physiological requirements and to details of management. It is never an excuse for neglect.

Intestinal Anastomosis Without Clamps.—A simple, safe method of intestinal anastomosis has been devised by Berman and Mainella avoiding the use of cumbersome clamps that may cause trauma to the bowel. A foam rubber sponge is sterilized and cut to size on the operating room table to fit the circumference of the bowel in question. Usually 3 by 1 by ½ in. (7.5 by 2.5 by 1.3 cm.) is the size needed for small intestines. For large intestines a strip 4 in. long is necessary. In end-to-end anastomosis the technique used is as follows: Before the bowel is opened it is cleaned of its contents. The foam rubber strip is then wrapped tightly around the bowel and sutured through a bloodless area at the mesenteric border snugly enough to prevent escape of the bowel contents. The same procedure is performed at the opposite end of the segment of bowel that is to be resected. After the resection and anastomosis have been completed, the sutures are cut and the foam rubber removed. This method has been used likewise in lateral anastomosis, in ileostomy, and in resection of the large bowel, particularly the sigmoid. The new method is particularly useful in procedures affecting the small bowels, especially in children. There is no fear of leakage. It is also suggested for use in blood vessel surgery.

Arch. Physical Med. & Rehabilitation, Chicago

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Research Methodology. K. S. Lion.—p. 217.
Rehabilitation of the Hard of Hearing. H. A. Carter.—p. 224.
Clinical Applications of Ultrasonic Energy in Treatment of Acute and Chronic Subacromial Bursitis. H. J. Bearzy.—p. 228.
*Serum Neuritis: Analysis of 16 Cases. A. L. Watkins.—p. 231.
Rehabilitation of Amputee Patient. D. A. Covalt.—p. 235.
Single Bout Elbow Flexion and Shoulder Flexion Ergography Under Conditions of Exhaustion Testing. H. H. Clarke.—p. 240.

Serum Neuritis.—The occurrence of painful, long-lasting, and disabling neuritis as a complication of serum disease in 15 young men between the ages of 16 and 37 and one 65-year-old man is reported. Of the 16 patients, 15 had received tetanus antitoxin because of an injury, usually an occupational accident, while one patient had received antimeningococcus serum for meningitis. In all the patients the neuritis was confined to one or both upper extremities. In five patients the involvement was bilateral, but unilateral paralysis always occurred on the right regardless of the site of injection, with predilection for the muscles supplied by the fifth and sixth cervical roots. In the usual clinical course the onset of serum sickness occurs 3 to 10 days after the injection of foreign serum followed by signs and symptoms of neuritis from a few hours to a few days after the serum sickness. Two of the author's patients, however, had unusual clinical manifestations as follows: in one the neuritis occurred on the sixth day after the injection and preceded the serum sickness, since the characteristic urticarial rash appeared only on the 19th day after the injection; the other patient had generalized muscular fasciculations resembling clinically and electromyographically those observed in progressive muscular atrophy. Smooth muscle of the gastrointestinal tract was also involved, but all symptoms completely subsided within a week. In the author's series adequate follow-up was not secured; but in 14 patients in whom a reaction of degeneration was present, a significant degree of paralysis developed after three months in 5, and after six months in 8 patients, two of whom showed residual weakness of 12 to 18 months' duration. Only two patients had definite return to normal power which occurred within one and three months respectively; neither had electromyographic changes. Quantitative studies of electrical excitability have been found to be of prognostic value in determining the extent and duration of disability. The mechanism of production of serum neuritis has not yet been explained. It would seem important that, because of the industrial disability occasioned by the serum neuritis, the use of tetanus antitoxin, particularly in industrial practice, be avoided whenever possible by previous immunization with tetanus toxoid.

Blood, New York

8:295-398 (April) 1953

Myeloproliferative Disorders, with Special Reference to Myelofibrosis. M. S. R. Hutt, J. L. Pinniger and G. Wetherley-Mein.—p. 295.
Influence of Intra-Arterial Administration of Histamine Upon Circulating Leukocytes of Man. H. R. Bierman, R. L. Byron Jr., K. H. Kelly and others.—p. 315.
Antifibrinolytic Activity in Plasma After Exposure to Cold and After Chymotrypsin Administration. H. Jensen, D. L. Chamovitz, E. Volkringer and others.—p. 324.
*Value of Routine Bone Marrow Culture for Histoplasma Capsulatum in Pediatric Hematology. R. J. Rohn and W. H. Bond.—p. 329.
Action of Alpha-Tocopherol Phosphate on Hemolysis in Paroxysmal Nocturnal Hemoglobinuria. M. J. Williams and M. P. Clapp.—p. 336.
Adrenal Cortex and Hemolysis. I. Phenylhydrazine. J. D. Feldman, M. Rachmilewitz, O. Stein and Y. Stein.—p. 342.
Humoral Regulation of Red Cell Production. A. Ersley.—p. 349.
Treatment of Pernicious Anemia with Crystalline Vitamin B_{12b}. L. M. Meyer, A. Sawitsky, N. D. Ritz and C. Brahin.—p. 358.
*Pelger-Huët Familial Anomaly of Leukocytes. Y. Yamasowa, T. Fujii and K. Tsuchitori.—p. 370.

Routine Bone Marrow Culture for Histoplasma Capsulatum.—Rohn and Bond say that other investigators, on the basis of 193 tests with only one positive result, had concluded that routine cultures of the bone marrow for Histoplasma capsulatum have little value in histoplasmosis case-finding. Although their own observations on adults had likewise been largely negative, they decided to make routine tests for H. capsulatum on children, particularly since their Children's Hospital serves an area in which histoplasmosis is endemic. Of 76 bone marrow cultures in pediatric patients with a variety of hematological abnormalities, 5 (6.5%) yielded H. capsulatum. In two of the five cases of histoplasmosis, organisms were observed on direct examination of the marrow and cultures were only of confirmatory value. In the other three patients with histoplasmosis, direct examination of marrow showed no signs of histoplasmosis, but culture of the bone marrow yielded H. capsulatum and was the only means of establishing the diagnosis. In none of the cases in which bone marrow culture for H. capsulatum gave negative results could the diagnosis of histoplasmosis be established by other methods. The authors are of the opinion that, while routine marrow culture for H. capsulatum is of little value in adults, it is of considerable value for case-finding in infants and children.

Pelger-Huët Familial Anomaly of Leukocytes.—The anomaly of granulocytic leukocytes first described by Pelger in 1928 is characterized by a lack of normal segmentation of the nucleus. Although the nuclear chromatin is of the mature type, cells with more than two lobes to the nucleus are few and the majority of cells are unsegmented staff forms. Huët, in 1932, disclosed the hereditary nature of the anomaly. Yamasowa and associates describe the fourth case of Pelger-Huët anomaly observed in Japan. The patient was a 50-year-old woman. To obtain further information on the familial occurrence of this disorder, 74 of the 94 blood relatives in four generations and 5 of 25 living spouses were examined. Pelger's anomaly was found in 25 additional cases, that is, in a total of 26 out of 80. The studies confirmed the hematological findings described by Pelger and others, and the genetic data support Huët's concept of the simple Mendelian inheritance.

California Medicine, San Francisco

78:257-416 (April) 1953

Coccidioidomycosis as Tool in Study of Granulomatous Disease. J. W. Wilson.—p. 257.
Retroperitoneal Tumors in Children: Roentgen Diagnosis. H. L. Steinbach and R. F. Brown.—p. 263.
Mediastinal Tumors of Thymic Origin. F. M. Binkley, J. D. Thorburn, H. B. Stephens and O. F. Grimes.—p. 267.
Is it Neurosis? J. Peters.—p. 274.
Measurement of Thyroxin Synthesis with I^{131}: Test for Evaluation of Thyroid Function in Equivocal States. M. E. Morton.—p. 277.
Rheumatic Fever and Rheumatic Heart Disease: Incidence in California. A. F. Goggio.—p. 280.
Primary Pulmonary Resection for Tuberculosis: Medical and Economic Aspects in Small Sanatorium. L. M. Barber, P. C. Samson and D. Dugan.—p. 282.
Primary Carcinoma of Duodenum. H. P. Tompkins.—p. 285.
One-Stage Bilateral Radical Neck Dissection: Indications and Technique. S. L. Perzik.—p. 288.
Congenital Syphilis in California. A. F. Brewer and P. K. Condit. —p. 293.
Delinquency in Women. J. E. McGinnis.—p. 299.
Auxiliary Treatment of Psychotic Women: Group Therapy for Their Husbands. G. Gordon and K. M. Bowman.—p. 303.
General Anesthesia in Ophthalmology. G. L. Kilgore.—p. 309.

Connecticut State Medical Journal, Hartford

17:279-378 (April) 1953. **Partial Index**

Importance of Occupational Disease Reporting. J. Lieben.—p. 301.
Neoplasms in Identical Twins: (Case Reports of Three Pair). H. Pastel, K. T. Phillips and L. G. LaPalme.—p. 303.
Measurement of Normal Interpedicular Space in Child. W. E. Landmesser Jr. and G. W. Heublein.—p. 310.
Can Hospital Costs be Controlled? C. R. Rorem.—p. 314.

Delaware State Medical Journal, Wilmington

25:55-76 (March) 1953

The A. B. C. of Antimicrobial Therapy. H. F. Flippin.—p. 55.
Problems Affecting Mal-United and Un-United Femoral Shaft Fracture. P. C. Colonna.—p. 63.
Luetic Osteomyelitis: Case Report. W. L. Bailey.—p. 71.

Endocrinology, Springfield, Ill.

52:245-366 (March) 1953

Comparative Effect of ACTH, Cortisone and DCA on Renal Function, Electrolyte Excretion and Water Exchange in Normal Dogs. J. O. Davis and D. S. Howell.—p. 245.
Studies on Interrelationships of Adrenal Cortex and Renal Ammonia Excretion by Rat. O. W. Sartorius, D. Calhoon and R. F. Pitts.—p. 256.
*Comparison of Potency of Different ACTH Preparations by Intravenous and Subcutaneous Routes of Injection. R. W. Bates.—p. 266.
Rates of Protein Synthesis, Amino Acid Catabolism and Size of Nitrogen Pool During Nitrogen Storage Induced with Testosterone Propionate, and Testosterone Propionate Combined with Growth Hormone. P. D. Bartlett.—p. 272.
Interconversion of Estrone and Estradiol-17β by Rat Liver Slices. K. J. Ryan and L. L. Engel.—p. 277.
Interconversion of Estrone and Estradiol by Human Tissue Slices. K. J. Ryan and L. L. Engel.—p. 287.
Inhibition of Development of DCA Hypertension by New Synthetic Steroid. R. O. Stafford, L. C. Thole and K. J. Olson.—p. 292.
Assay of ACTH Activity Based on Eosinopenic Response in Normal and Hypophysectomized Mice. R. S. Speirs.—p. 300.
Action of Desoxycorticosterone Acetate on Mammary Gland of Immature Ovariectomized Rat. T. C. Smith and L. E. Braverman.—p. 311.
Evidence for Dual Action of Parathyroid Extract in Maintaining Serum Calcium and Phosphate Levels. R. V. Talmage, F. W. Kraintz, R. C. Frost and L. Kraintz.—p. 318.
Effects of Cortisone and Desoxycorticosterone on Renal Tubular Reabsorption of Phosphate and Excretion of Titratable Acid and Potassium in Dogs. K. E. Roberts and R. F. Pitts.—p. 324.
Cyto-Physiologic Aspects of Thyrotrophic Hormone Secretion in Goitrous Guinea Pig. S. A. D'Angelo.—p. 331.
Effect of Hypophysectomy on I^{131} Metabolism in Normal and Thiouracil Treated C_3H Mice. S. H. Wollman and R. O. Scow.—p. 338.
Mechanisms of Partial Blockade of Stress Response in Rats by Dibenamine Analogues. C. H. Sawyer and G. R. Parkerson Jr.—p. 346.

Potency of Corticotropin Preparations.—Rats whose hypophyses had been removed were injected subcutaneously or intravenously with two different types of preparations of corticotropin (ACTH); both preparations were obtained from frozen hog pituitary glands, but one from acid extracts and the other from basic or alkaline extracts of these glands. The left adrenal gland was removed one hour and the right adrenal two hours after the injections for determination of the ascorbic acid content. As much as 100 to 1,000 times as much corticotropin was required by the subcutaneous route as by the intravenous route to cause equivalent ascorbic acid depletion. Estimates of the relative potency of the two types of corticotropin preparations differed with the route of injection by 3 to 11 times. Different estimates of potency by the different routes of administration are important clinically because most corticotropin is used by routes of injection other than the intravenous route, which is used for standardization. Most differences in physiological efficacy of corticotropin are as readily explained on the basis of different rates of absorption, which depends on the route of injection and the nature and formulation of the preparation, as on the basis of a qualitative difference in corticotropin present, i. e., the multiple factor theory. The reported data are, therefore, interpreted as not supporting the multiple ACTH factor theory.

Fertility and Sterility, Philadelphia

4:101-182 (March-April) 1953

Higher Epididymal Obstructions in Male Infertility: Etiology and Treatment. E. W. Macmillan.—p. 101.
Reproductive Tract Pathology in Hyperkeratosis of Cattle and Sheep. K. McEntee and P. Olafson.—p. 128.
*Crystallization Test as Guide to Treatment of Cervical Hostility. A. Campos da Paz.—p. 137.
New Instrument for Artificial Insemination of Cattle: Remarks on Physiologic Breeding Failure. A. Kissileff.—p. 149.

Treatment of Cervical Hostility Guided by Crystallization of Cervical Mucus.—Studies of the cervical mucus carried out by Campos da Paz demonstrated that a fern-like crystallization of the cervical mucus is present in the first half of the menstrual cycle and during the ovulation period. It is absent after ovulation, during pregnancy, and after the menopause, at which time only the cellular content of the mucus is evident. Only during anovulatory menstrual cycles with normal estrogen levels was fern-like crystallization of the cervical mucus observed at any time of the cycle. Fern-like crystallization is closely related to the estrogen function. Progesterone does not cause its appearance but on the contrary it seems to inhibit it. Fern-like crystallization is closely related to the receptivity of the cervical mucus to spermatozoa. As the crystallization loses its characteristic features, the receptivity of the mucus diminishes. When the crystallization is absent, the mucus as a rule is hostile to spermatozoa. These observations induced the author to give estrogens a therapeutic trial in 53 sterile women in the first phase of 215 menstrual cycles. All the patients treated had had negative results of a Simms-Huhner test during the ovulation period and absence of the fern-like crystallization of the cervical mucus. Estradiol benzoate was administered intramuscularly in all patients. The use of 5 mg. of the drug on the 10th day of the cycle in certain patients and on the 5th and 10th day in others were the schedules of treatment that gave the best results. With the fern-like crystallization test, the exact dose of estrogen to be used was determined easily in each case. Of the 53 patients treated by this method, pregnancy occurred in only 9. These apparently poor results are explained by the following facts: seventeen patients submitted to this treatment for one to three cycles only, abandoning it afterwards. In nine patients the inhibiting effect of cervical mucus was not the cause of the sterility. Eighteen patients are still under treatment. Of the nine patients in whom pregnancy was accomplished, fecundation occurred in the fourth cycle of treatment in two, in the fifth cycle of treatment in three, in the sixth cycle of treatment in two, and in the remaining two patients, in the eighth and tenth cycles of treatment. Estrogen therapy, although not definitely removing cervical hostility, is capable of producing the cervical receptivity necessary to the progression of spermatozoa into the cervix in every cycle. If the treatment does not give satisfactory results after at least six to eight cycles, the couple must be studied further for other causes of sterility.

Florida Medical Association Journal, Jacksonville

39:709-786 (April) 1953

Treatment of Badly Comminuted Fractures with the Rush Nail. A. H. Lisenby.—p. 727.
Otitis Externa. W. H. Turnley.—p. 729.
Pott's Fractures and Associated Injuries. L. D. Baker.—p. 732.
Phase of Postpartum Bleeding with Case Reports. M. R. Clements. —p. 739.
Importance of Early Treatment of Childhood Allergy in Modifying and Preventing Adult Allergic Disorders. W. A. McGee.—p. 741.

Journal of Bacteriology, Baltimore

65:227-354 (March) 1953. **Partial Index**

Oxidation of Maltose by Acetobacter Melanogenum. I. O. Foda and R. H. Vaughn.—p. 233.
Evidence for Coenzymatic Nature of Synthetic Cofactor Involved in Biotin Related Deaminase Systems. V. R. Williams and J. F. Christman. —p. 238.
Reduction of Tetrazolium Salts by Pleuropneumonialike Organisms. N. L. Somerson and H. E. Morton.—p. 245.
Growth, Respiration, and Nucleic Acid Synthesis in UltraViolet-Irradiated and in Photoreactivated Escherichia Coli. A. Kelner.—p. 252.
Variation in Shape and Arrangement of Bacterial Flagella. E. Leifson and R. Hugh.—p. 263.
Demonstration of Yeast Bud Scars with Electron Microscope. J. W. Bartholomew and T. Mittwer.—p. 272.
Method for Microscopical Study of Actinomycetes. G. Giolitti and M. Bertani.—p. 281.
Action of Aureomycin on Escherichia Coli Bacteriophage T_3 System. R. A. Altenbern.—p. 288.
Staling in Bacterial Cultures. W. R. Lockhart and D. M. Powelson. —p. 293.
*Radiation Sterilization: I. Effect of High Energy Gamma Radiation from Kilocurie Radioactive Sources on Bacteria. W. Tarpley, J. Ilavsky, B. Manowitz and R. V. Horrigan.—p. 305.
Reduction of Chloromycetin and Related Compounds by Escherichia Coli. G. N. Smith and C. S. Worrel.—p. 313.
Calcium as Growth Stimulant for Lactobacillus Casei. C. H. Eades Jr. and M. Womack.—p. 322.
Development of Bacteriophage in X-Ray Inactivated Bacteria. L. W. Labaw, V. M. Mosley and R. W. G. Wyckoff.—p. 330.
Inhibition of Anaerobic Pyruvate Metabolism of Escherichia Coli by Dihydrostreptomycin. I. L. Barkulis.—p. 337.
Effect of Carbon Dioxide and Aging on Dihydrostreptomycin Inhibition of Pyruvate Fermentation in Escherichia Coli. E. Zebovitz and J. W. Moulder.—p. 344.

Radiation Sterilization.—Tarpley and associates point out that one of the main advantages of sterilizing heat-sensitive pharmaceutical preparations with x-rays and gamma rays is the ability of these ionizing radiations to penetrate thick-walled packaging materials and yet cause a negligible temperature rise. Previous studies on the effect of radiation on various types of micro-organisms were carried out mostly with radioactive sources of low intensity. Sources of greater intensity (1,000 curie) and even more intense radioactive by-products from the atomic energy program are now available. Earlier investigations were carried out with 1.1 to 1.3 million electron volt gamma rays in the tubular radioactive cobalt (Co^{60}) and tantalum (Ta^{182}) sources developed by the Brookhaven National Laboratory. It was found that a very uniform radiation field exists within the central volume of these 1,000 curie sources which are contained in lead shields. The measurement of the radiation dose necessary to accomplish sterilization of a variety of micro-organisms and the effect on the sterilization dose of intensity of the radiation field were investigated. Heavily contaminated steroid suspensions were successfully sterilized by gamma rays produced by kilocurie sources of radioactive cobalt (Co^{60}) and tantalum (Ta^{182}). Radiation doses of between 2.7 and 3.2 megarep (rep $\times 10^6$) are required for sterilization when 0.1×10^9 organisms per milliliter are present initially. Clostridium sporogenes appears to be the most resistant organism studied in this investigation, molds and nonsporulating bacteria being killed more readily. A large fraction of the contaminating sporulating micro-organisms was destroyed by radiation doses of about 1.5 megarep, and those not killed showed morphological and cultural aberrations on subculture. Within the relatively long irradiation periods of this investigation, irradiation at lower intensity over long periods of time has no important bearing on the efficiency of the sterilization. This leads to the conclusion that many thicknesses of the material to be sterilized may be arranged around a radioactive source. By removing various portions at appropriate time intervals the radiation field may be utilized very efficiently.

Journal of Immunology, Baltimore

70:199-330 (March) 1953. **Partial Index**

Anaphylactic Reactions and Concentrations of Antibody in Rats and Rabbits: Effect of Adrenalectomy and of Administration of Cortisone. P. B. Dews and C. F. Code.—p. 199.
Serological Studies with Vibrio Metschnikovii. E. S. Wynne, C. L. Gott, D. A. Mehl and J. O. Norman.—p. 207.
Serologically-Active Erythrocyte-Sensitizing Substance from Typhus Rickettsiae. S. Chang.—p. 212.
Effect of Thiosemicarbazones and Dichlorophenoxy Thiouracil on Multiplication of Recently Isolated Strain of Variola-Vaccinia Virus in Brain of Mouse. S. A. Minton Jr., J. E. Officer and R. L. Thompson.—p. 222.
Lack of Agreement of Constant Toxin and Constant Antitoxin Flocculation Reactions of Diphtheria Toxin and Equine Antitoxin. H. E. Bowen and L. Wyman.—p. 235.
Studies on Immunization Against Plague: V. Multiplication and Persistence of Virulent and Avirulent Pasteurella Pestis in Mice and Guinea Pigs. D. L. Walker, L. E. Foster, T. H. Chien and others. —p. 245.
Fractional Dilution Procedure for Precise Titration of Hemagglutinating Viruses and Hemagglutination Inhibiting Antibodies. F. L. Horsfall Jr. and I. Tamm.—p. 253.
Quantitative Studies of Cross Reactions Between Shigella Flexneri Types 1a, 1b, and 3^1. S. B. Formal and E. E. Baker.—p. 260.
Immunization of Mice Against Histoplasma Capsulatum. S. B. Salvin. —p. 267.
Hemagglutinin of St. Louis Encephalitis Virus. R. M. Chanock and A. B. Sabin.—p. 271.
Antigen-Antibody Precipitates in Solid Medium with Influenza Virus. K. E. Jensen and T. Francis Jr.—p. 321.
Efficacy of Intracutaneous Route of Injection and Susceptibility of Hartley Strain of Guinea Pigs in Experimental Allergic Encephalitis. M. M. Lipton and J. Freund.—p. 326.

Journal of Investigative Dermatology, Baltimore

20:247-328 (April) 1953

*Studies of Methods of Determining Capillary Fragility: II. Negative Pressure Technique Using Petechiometer.® D. J. Perry and I. H. Linden.—p. 251.
Histology and Cytochemistry of Human Skin: III. Polymorphism and Chromotropy of Mast Cells. W. Montagna and H. P. Melaragno. —p. 257.
Super-Ego and Aggression in Circumscribed Neurodermatitis. P. F. D. Seitz, J. S. Gosman and J. Craton.—p. 263.
Study of Local Tissue Reactions in Man to Cortisone and Compound F. VI. Histopathological Studies of Local Effect of Compound F in Normal and Pathologic Skin of Man. L. Goldman, H. O'Hara E., and J. Baskett.—p. 271.
Physiology of Human Axillary Apocrine Sweat Gland. W. B. Shelley and H. J. Hurley Jr.—p. 285.
*Clinical and Experimental Studies with 8-Methoxypsoralen in Vitiligo. A. B. Lerner, C. R. Denton and T. B. Fitzpatrick.—p. 299.
Effects of Cortisone on Experimental Coccidioidomycosis. V. D. Newcomer, E. T. Wright, J. E. Tarbet and others.—p. 315.

Determination of Capillary Fragility by Means of Petechiometer.—In a previous investigation on 190 white male subjects Perry and Linden had found that the age of the subject and the time of the test exert some influence on the result of the Rumpel-Leede test. They now present the results of Petechiometer studies on 100 of these same persons. The Petechiometer consists of a bell suction cup 2 cm. in diameter. A cylinder containing a plunger is attached to the suction cup. The plunger has grooves, each of which represents an increment of 5 cm. Hg suction. With this apparatus suction ranging from 5 to 30 cm. Hg can be obtained. The various suctions are obtained by placing a stop ring on the appropriate slot on the plunger. The edge of the bell is lubricated with petrolatum and then firmly placed on the previously marked test site. Next the plunger is released, and the suction produced is applied for one minute. The lowest pressure yielding two or more petechiae was considered as the end point and was recorded as the capillary fragility (or resistance) of the test site. In each subject six areas were tested on contralateral sides. The results of the studies with the Petechiometer indicate that none of the six areas studied are adequate sites for measuring capillary resistance. The forearm, upper arm, and infraclavicular regions cannot be used because of the difference observed between the two sides. The back is not suitable because of its low median value. The thigh and legs might be of some value as test sites but require additional studies. Even if such studies would substantiate these regions for testing capillary resistance, many other factors are thought to exert some influence. The effects of temperature, barometric

pressure, menses, thickness of skin, season, and allergies would have to be investigated before the Petechiometer could be considered as an accurate means of measuring capillary resistance in these areas. The authors feel that the Petechiometer is not a reliable instrument for measuring capillary fragility.

Studies with 8-Methoxypsoralen in Vitiligo.—Lerner and associates report the results of clinical and experimental studies with 8-methoxypsoralen (xanthotoxin, ammoidin). Of the nine patients with vitiligo treated with 8-methoxypsoralen, three patients showed striking improvement, two showed less but definite improvement, and four showed no change. The patients ranged in age from 15 months to 49 years and were treated for 1 to 20 months. The daily dose of the drug was 10 to 50 mg. given orally in divided doses supplied in 10 mg. capsules. Six of the patients showed no reaction to the drug, and three had mild symptoms not requiring discontinuation of the medication. It was observed that three of the nine patients dedeveloped marked increase in tolerance to ultraviolet light. It was not known whether this inhibition of the erythema reaction to sunlight was due to previous exposure to ultraviolet light or to the drug. To study this problem further, 8-methoxypsoralen was given to three persons with albinism. Two of the albinos were treated for three months and the third for two months. All showed decreased sensitivity to ultraviolet light. Two stated that they no longer wore hats when out in the sun. After discussing toxicity and in vitro studies with the drug, the authors say that the psoralen derivatives discussed in this paper have been isolated from a variety of natural sources, including expressed citrus peel oils, bergamot oil, and the plants, Ammi majus Linn, Angelica archanglica, and others. Whereas oral use of this drug decreases the erythema response of patients to ultraviolet light, local application increases this response. Persons handling the drug should not let it come in contact with the skin. One laboratory worker's arm came in contact with an alcoholic solution of 8-methoxypsoralen. Shortly thereafter, following exposure to ultraviolet light, a hyperpigmented spot developed on the arm. In appropriate doses 8-methoxypsoralen is well tolerated. Complete blood studies, urinalyses, examinations for urinary porphyrins, prothrombin times, and liver function tests, except cephalin cholesterol flocculation test, were within normal limits. Some patients had weakly positive cephalin cholesterol flocculation tests after two months of therapy. It is suggested that this test be done monthly for three months, and then at less frequent intervals, on patients receiving the drug.

Journal Lab. and Clinical Medicine, St. Louis

41:337-498 (March) 1953

In Vitro Studies of Aspects of Metabolism of Sodium by Human Erythrocytes Using Sodium^{22}. W. D. Love and G. E. Burch.—p. 337.

Comparison of Potassium^{42}, Rubidium^{86}, and Cesium^{134} as Tracers of Potassium in Study of Cation Metabolism of Human Erythrocytes In Vitro. W. D. Love and G. E. Burch.—p. 351.

Observations on Etiologic Relationship of Achylia Gastrica to Pernicious Anemia: XV. Hematopoietic Effects of Simultaneous Intravenous and of Simultaneous or Serial Oral Administration of Intrinsic Factor and Vitamin B_{12}. R. O. Wallerstein, J. W. Harris, R. F. Schilling and W. B. Castle.—p. 363.

Further Studies on Metabolism of L-Tyrosine in Scorbutic Monkeys: Effect of Folinic Acid, Cortisone, Adrenalectomy, and Sulfhydryl Groups on Urinary Excretion of P-Hydroxy-Phenyl Compounds. R. J. Salmon and C. D. May.—p. 376.

Comparative Effects of Menadione Sodium Bisulfite and Vitamin K_1 on Hypoprothrombinemia Induced by Dicumarol. W. G. Bannon, C. A. Owen Jr. and N. W. Barker.—p. 393.

Metabolism of Water and Electrolytes in Congestive Heart Failure. II. The Distribution of Water and Electrolytes in Skeletal Muscle in Edematous Patients with Congestive Heart Failure Before and After Treatment. P. J. Talso, N. Spafford and M. Blaw.—p. 405.

Range of Efficacy of Sodium Chloride Solutions in Treating Severe Thermal Injury in Rat. M. D. McCarthy and N. Newlin.—p. 416.

Extravascular Diffusion of Dextran from Blood. J. L. Bollman.—p. 421.

Mechanism of Change in Cerebrospinal Fluid Pressure Following an Induced Change in Volume of Fluid Space. H. W. Ryder, F. F. Espey, F. D. Kimbell and others.—p. 428.

Bronchospirometry. E. A. Gaensler, T. R. Watson Jr. and W. E. Patton.—p. 436.

Journal Nat. Cancer Inst., Washington, D. C.

13:1099-1398 (April) 1953

Use of Cell Colonies on Glass for Evaluating Nutrition and Growth in Roller-Tube Cultures. R. L. Ehrmann and G. O. Gey.—p. 1099.

Cytological Changes Following Roentgen Irradiation of the Liver in Mice. M. E. Wilson and R. E. Stowell.—p. 1123.

Tumors of Liver and Urinary Bladder of the Dog After Ingestion of 1. Acetylaminofluorene. H. P. Morris and W. H. Eyestone.—p. 1139.

Dose-Response Relations in Experimental Transmission of Avian Erythromyeloblastic Leukosis: II. Host-Response to Whole Blood and to Washed Primitive Cells. E. A. Eckert, D. Beard and J. W. Beard.—p. 1167.

Cytological Effect of Chemicals on Ascites Sarcomas: I. Partial Damage in Tumor Cells by Podophyllin, Followed by Temporary Regression and Prolongation of Life of Tumor-Bearing Rats. S. Makino and T. Tanaka.—p. 1185.

Damage Induced in Sarcoma 37 With Chemical Agents: V. Derivatives of Colchicine and Isocolchicine. J. Leiter, J. L. Hartwell, G. E. Ullyot and M. J. Shear.—p. 1201.

Cytological Studies of Tumors: IX. Characteristic Chromosome Individuality in Tumor Strain-Cells in Ascites Tumors of Rats. S. Makino and K. Kanô.—p. 1213.

Statistical Association Between Smoking and Carcinoma of the Lung. D. A. Sadowsky, A. G. Gilliam and J. Cornfield.—p. 1237.

Lesions Induced in Mice by Painting with p-Dimethylaminobenzene-1-Azo-2-Naphthalene. A. S. Mulay and E. A. Saxén.—p. 1259.

Survival of Mamary Tumor Milk Agent in Cultures of Heterologous Cells. M. A. Pikovski.—p. 1275.

Tobacco-Smoking Habits in an American City. C. A. Mills and M. M. Porter.—p. 1283.

Survey of Transplantable and Transmissible Animal Tumors. L. J. Dunham and H. L. Stewart.—p. 1299.

Journal of Nutrition, Philadelphia

49:373-548 (March) 1953. Partial Index

Comparative Effects of Pantothenic Acid Deficiency and Inanition on Resistance to Cold Stress in the Rat. B. H. Ershoff.—p. 373.

Effect of Vitamins and Natural Products on Liver Ascorbic Acid of Sulfasuxidine-Fed Rats. M. A. Schwartz and J. N. Williams Jr.—p. 387.

Effect of Fat-Free Diet on Growing Female Rats, with Special Reference to Endocrine System. T. C. Panos and J. C. Finerty.—p. 397.

Leukocyte Production in Pantothenic Acid-Deficient Mice. D. R. Weir.—p. 425.

Effect of Choline Supplements on Fatty Metamorphosis and Liver Cell Damage in Choline and Protein Deficiency. D. Koch-Weser, J. de la Huerga and H. Popper.—p. 443.

Oxidative Enzymes of Liver in Protein Depletion. W. W. Wainio, B. Eichel, H. J. Eichel and others.—p. 465.

Vitamin B_{12} and Folic Acid in Milk Diets. R. A. Collins, M. Schreiber, C. A. Elvehjem and E. B. Hart.—p. 485.

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Indications for Tonsillectomy and Adenoidectomy in Children. G. O. Proud.—p. 262.

Hearing Impairments in Children.—Of 2,628 cases in which the causes of hearing loss in children have been analyzed during the past 15 years, 1,688 (64.2%) were classified as cases of conduction loss and 940 (35.8%) as cases of perception loss. The ratio of conduction loss cases to perception loss cases thus was 2:1. Of the 940 children with perception loss, 310 had completely normal hearing in one ear with no hearing in the other ear; the remaining 630 had partial impairment in one or both ears. It has been calculated that in 1,155 (68.4%) of the 1,688 children with conduction loss, the loss was due to otitis media; it could have been prevented in nearly every

case. There were 36 children with proved middle ear effusion; in these patients diagnosis has been made during the past four years, suggesting that middle ear effusion as a cause of hearing loss in children is on the increase. In 630 children with partial impairment of hearing in one or both ears, measles were found to be the possible cause in 109 and mumps in 22. While the incidence of measles is three times as great as the incidence of mumps, in this series measles appeared to be the cause of hearing impairment in five times as many cases as mumps. These findings suggest that the measles virus as a cause of perception hearing loss in children is probably of greater significance than has been reported in previous publications. Of the 630 children with partial perception loss, 461 had had more than one hearing test; 445 (96.5%) of these showed no appreciable change in their hearing, while 16 showed a progressive loss of hearing. This progressive loss was definite and extensive. Although the incidence of progressive perception hearing loss does not appear to be very great, when it occurs it is of serious consequence. The progress was not noted until a wearable hearing aid had been put on these children; in every instance the hearing loss was more pronounced in the ear in which the hearing aid was used. Sustained sound levels of high intensity can cause permanent cochlear damage in an otherwise normal ear, and this phenomenon may prevail in a previously damaged cochlea.

Missouri Medicine, St. Louis

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New England Journal of Medicine, Boston

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*Ewing's Sarcoma: Study of 50 Cases Treated at Massachusetts General Hospital, 1930-1952 Inclusive. C. C. Wang and M. D. Schulz.—p. 571.
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Internal Drainage of Pseudocyst of Pancreas. A. J. Ryan and T. P. Murdock.—p. 602.

Ewing's Sarcoma.—Between 1930 and 1952 27 male and 23 female patients between the ages of 3½ and 43 years with histologically proved Ewing's sarcoma were treated at the Massachusetts General Hospital. Of the total, 36 were treated with external irradiation alone, 10 with radical surgery, and 4 by surgery followed by x-ray therapy. Thirty-three (66%) of the patients were less than 20 years old. In 34 of the 50 patients the location of the primary lesion was below the waistline. Only one of the surgically treated patients lived more than five years. Nine patients died of their disease, four within one year and five within 19 months to four years after operation. In this group the primary tumor was located, with one exception, in an extremity. Of the four patients in whom operation was followed by roentgen therapy, two, each with a lesion of a rib, died within six months; one with a tumor in a fibula died within three months, and one was lost to observation. Of the 22 patients who received external irradiation aimed at a cure of the disease, 4 survived without disease for 6½, 9, 12 and 13 years, respectively. Three others are living, one for four years but with disease, and two without disease for two years and six months respectively. Of the remaining 15 patients who died of their disease, 12 died within a year of treatment. Of 14 patients given palliative irradiation, 1 lived for seven years after the initial treatment and died of widespread metastases. Of the 22 patients treated by irradiation, 15 had no evidence of local recurrence of the tumor, the tumor was not controlled in 4, and the response to irradiation was undetermined in 3. The maximum tumor dose administered was 6,000 r. A dose as small as 1,000 r was sufficient to control the local lesion in one patient. It is believed that a tumor dose of approximately 4,000 to 5,000 r, fractionated at the rate of 200 to 300 r (air incident) per day, is probably sufficient for primary control of most Ewing's sarcomas. As a result of their experience, the authors consider external irradiation the method of choice in the treatment of this particular type of malignant tumor, which does not always follow the expected relentless course of a highly malignant neoplasm. External irradiation does not deprive the patient of a useful or cosmetically desirable part. In 4 (18%) of the 22 patients treated by radical irradiation, apparent cures were obtained. Palliative radiation therapy gave not only relief of discomfort but also an often unexpectedly long and useful life.

Dibenzyline in Treatment of Hypertension.—Dibenzyline (N-phenoxyisopropyl-N-benzyl-β-chlorethylamine), a specific, orally active, adrenergic blocking agent was given to 32 patients with severe essential hypertension. Outpatients were given one gelatin capsule of 20 mg. every five hours, and the dose was increased at weekly intervals until the blood pressure fell or toxic manifestations occurred. Hospitalized patients were given a 20 mg. increase in dose every four hours until a hypotensive effect or toxic manifestations occurred. Twenty-three patients (72%) responded with a fall of more than 20 mm. Hg in the mean blood pressure. In the standing position, the blood pressure decreased to less than 150/100 mm. Hg in 15 patients (47%). The average dose of the drug required by the responsive patients was 138 mg. four times a day in those with diastolic pressures over 140 mm. Hg, and 127 mg. four times in those with diastolic pressures under 140 mm. Hg. The largest dose used in the responsive patients was 360 mg. four times daily. A few patients required as little as 20 to 60 mg. four times daily. By the end of three months, administration of the drug had to be discontinued in 8 of the 23 patients who had obtained an initial hypotensive effect because of distressing side-effects such as tachycardia, dizziness, syncope, and gastrointestinal irritation. These side-effects could not be eliminated by variation in dosage even under hospital conditions. Only 11 of the 23 patients felt sufficiently benefited to continue the treatment for more than three months. These results were compared with those obtained in similar groups of patients, 54 treated with hexamethonium, 61 treated with extracts of Veratrum viride, and 52 treated with hydralazine (Apresoline). Comparison indicated that hexamethonium is the drug of choice in hypertension. Combined treatment with hydralazine was effective in about 50% of the patients who did not obtain an adequate reduction in blood pressure with hexamethonium alone.

North Carolina Medical Journal, Winston-Salem

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Alcoholic Rehabilitation. L. Forizs.—p. 97.
Problem of Addictive Drinking: Beverage Alcohol in Simple and Complex Societies. R. E. Reed.—p. 101.
*Studies on Occurrence of Paracolon and Non-Lactose Fermenting Enteric Bacteria in General Hospital Patients. R. A. Hare and P. R. Beamer. —p. 105.
Harelip-Cleft Palate Problem. W. T. Berkley Jr.—p. 108.
Mixed Mesodermal Tumors of Uterus: Clinical Study with Report of Case. W. B. McCutcheon, J. J. McDonald and J. D. Piver.—p. 116.
Curability of Carcinoma of Uterine Cervix: Comparison of Radiologic and Surgical Methods of Treatment. J. R. Andrews, T. O. Coppedge, D. L. Whitener and C. H. Purdy.—p. 118.
*Replacement of Portion of the Parotid Duct by a Plastic Tube R. B. Perkins and D. E. Ward Jr.—p. 122.

Enteric Bacteria.—The hospitalization of an unusual number of patients with symptoms of gastroenteritis during winter and spring rather than in summer and fall when the incidence is usually higher, stimulated studies on the feces of such patients in an effort to identify causal agents. When it was found early in the course of these studies that Salmonella and Shigella organisms were not found regularly and it was apparent that most of the cases of gastroenteritis were not caused by such well-recognized pathogens, attention was directed to the identification of all types of bacteria isolated from the stools. In all, 571 cultures were performed with fecal specimens from 130 patients with gastroenteritis and 292 persons without gastrointestinal symptoms. Five patients with gastroenteritis

harbored different types of Salmonella organisms, and four others harbored Shigella sonnei. Of the 130 patients with gastroenteritis (including the nine with Salmonella and Shigella species), 121 harbored strains of Paracolombactrum (paracolon) organisms, Pseudomonas aeruginosa, Alcaligenes faecalis, and four Proteus species. These types of enteric organisms were isolated from only 118 of the 292 patients who had no symptoms referable to the gastrointestinal tract. Eradication of paracolon and nonlactose-fermenting enteric bacteria from the intestinal tract resulted in apparent recovery in 44 more severely ill patients who were treated with chemotherapeutic and/or antibiotic agents. It is proposed that some Paracolobactrum (paracolon) strains and certain nonlactose-fermenting enteric bacteria deserve attention as possible causal agents of gastroenteritis, especially when adequate study fails to reveal well-recognized causal agents of gastrointestinal inflammation.

Portion of Parotid Duct Replaced by Plastic Tube.—Perkins and Ward present the case of a man, aged 46, who had accidentally shot himself in the left side of the face and head. The parotid gland could be seen deep in the wound, and 4 cm. of the parotid duct had been destroyed. A 6 cm. piece of polyethylene plastic tube was placed in the wound to bridge the defect and sutured to the proximal and distal ends of the parotid duct with 000 silk suture. No parotid secretions were noted draining from the wound either before or after secondary closure. The wound was treated with warm saline soaks, and the patient was given penicillin parenterally. Nine days after the operation a delayed primary closure of the face wound was done. The polyethylene tube remained patent, and there were no complications referable to the left parotid gland nine months following surgery.

Oklahoma State Medical Assn. J., Oklahoma City

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"Timing" in Labor. B. D. Faris.—p. 70.

Pennsylvania Medical Journal, Harrisburg

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Problems Relating to Recognition of Hydronephrosis in Everyday Medical Practice. R. M. Nesbit.—p. 261.
Treatment of Pancreatitis. J. E. Berk.—p. 265.
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Criteria for Use of Anticoagulants in Acute Myocardial Infarction. S. Baer, S. O. Krasnoff and W. I. Heine.—p. 274.
Acute Obstruction of the Pulmonary Circulation. T. M. Durant.—p. 279.
Recent Advances in Management of Intestinal Obstruction. H. R. Hawthorne.—p. 284.

Proc. Staff Meet. Mayo Clinic, Rochester, Minn.

28:193-216 (April 8) 1953

Severe Crush Injuries of Chest: Some Problems in Management. P. E. Bernatz, J. W. Kirklin and A. M. Olsen.—p. 193.
*Dextran for Nephrotic Edema: Clinical Experience. J. T. Olive Jr., S. D. Mills and J. S. Lundy.—p. 199.
Metastatic Hypernephroma of Thyroid Gland. O. H. Beahrs, R. L. Ginsberg and G. E. Miller.—p. 205.
Evaluation of New Agent in Treatment of Parkinsonism. D. W. Mulder.—p. 210.

Dextran for Nephrotic Edema.—A 10% salt-free solution of dextran was used in the treatment of the nephrotic edema of seven girls and five boys between the ages of 13 months and 14 years. The duration of the edema varied from one week to 16 months. All 12 children apparently had chronic nephritis; none had the so-called pure or lipoid nephrosis. Every child was hospitalized. Since a single infusion caused only a temporary increase in urinary output, to maintain the plasma colloidal osmotic pressure over a period long enough for removal of edema from the tissues, each child was given an intravenous infusion daily for 7 to 14 days. The dose of dextran was determined by the size of the child. Small children received 100 to 200 cc. of the solution, or 10 to 20 gm. daily. Large children were given 200 to 250 cc., or 20 to 25 gm. daily. The average daily dose was 1.43 gm. per kilogram of body weight. Treatment was discontinued when no further weight loss occurred or when it was obvious that diuresis would not take place. Seven of the 12 children had significant diuresis or loss of at least 15% body weight during and immediately after the period of treatment, but the diuretic effect was only temporary. All but one child had recurrence of edema after treatment was stopped. Three of the children showed reactions to the dextran during or after the first dose; the reaction was urticarial in two, and consisted in severe abdominal and back pain in one. No other deleterious effects were observed. Best results were obtained when dextran was given daily for 10 to 14 days. One child died 11 months after treatment, but information was not available regarding a postmortem examination.

Psychosomatic Medicine, New York

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Electroencephalogram in Psychological Disorders: Review. M. A. Kennard.—p. 95.
Studies of Personality of Patients Suffering from Urticaria. E. D. Wittkower.—p. 116.
Psychophysiological Factors in Ménière's Disease. E. P. Fowler Jr. and A. Zeckel.—p. 127.
Ulcerative Colitis: Psychoanalyses of Two Cases. A. Karush and G. Daniels.—p. 140.
Psychosomatic Concept in Dentistry. G. L. Ross, H. J. Bentley and G. W. Greene Jr.—p. 168.

Radiology, Syracuse, N. Y.

60:331-484 (March) 1953

Place of Physics in Clinical Radiology. R. H. Chamberlain.—p. 331.
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New Tissue-Like Material for Use as Bolus. D. D. Lindsay and B. E. Stern.—p. 355.
*Roentgen Hepatography by Injection of Contrast Medium into Aorta: Preliminary Report. L. G. Rigler, P. C. Olfelt and R. W. Krumbach.—p. 363.
*Percutaneous Transhepatic Portal Venography: Preliminary Report. H. L. Steinbach, H. R. Bierman, E. R. Miller and W. A. Wass.—p. 368.
Foreign Bodies in Kidney: Review of Literature and Reports of Four Additional Cases. J. D. Osmond Jr.—p. 375.
Radiographic Appearances of Hyaline Disease of Lungs in the Newborn: Case Report. I. Meschan, H. N. Marvin, V. H. Gordon and G. Regnier.—p. 383.
Right Pericardial Fat Pad. S. L. Cohen.—p. 391.
Chronic Arterial Occlusions of Lower Extremities: Arteriographic Study of 62 Cases. B. Milanes, E. Perez-Stable, R. Casanova and others.—p. 394.
Clinical Evaluation of Concentrated Iodine Preparation: For Intravenous Nephrography and Pyelography. A. W. Bohne and W. W. Christeson.—p. 401.
*Osseous Radiographic Findings of Chronic Renal Insufficiency. J. G. Davis.—p. 406.
Hereditary Multiple Diaphyseal Sclerosis (Ribbing). L. W. Paul.—p. 412.
Diaphragmatico-Pericardial Tear with Intrapericardial Herniation of Transverse Colon. J. Stein, H. P. Colmore and R. A. Green.—p. 417.
Mechanisms in Acquired Radioresistance of Cancer. P. O'B. Montgomery and S. Warren.—p. 421.
Method of Detecting Questionable Film Artifact. J. T. Marr.—p. 425.
Recording Timer for Arteriography. T. M. Fullenlove.—p. 428.

Roentgen Hepatography by Injection of a Contrast Medium into Aorta.—Rigler and his associates found that the introduction of a somewhat modified technique for abdominal aortography made it possible to observe the hepatic arterial circulation. The technique differed from that previously used for abdominal aortography in the following respects: (1) 70% sodium acetrizoate (Urokon) was used as a contrast material; (2) 40 cc. was injected within three seconds by the use of a no. 16 needle and a veterinary syringe; (3) the needle was directed cephalad; (4) the needle was directed upward in such a way as to enter the aorta at the level of the 11th thoracic vertebra. A roentgenogram was made prior to the injection, and a second one immediately on its completion. A third roentgenogram was taken four seconds and a fourth roentgenogram eight seconds after the injection. The contrast medium extends into the kidneys and also passes into the lower extremities. Compression bags over the lower aorta and blood pressure cuffs around the legs increased the intensity of the liver shadow to a minor degree. The authors emphasize that the opacification of the liver is the result of venous return to the portal circulation from the mesenteric veins as well as of contrast material coming into the hepatic artery. In cases of cirrhosis of the liver the authors were able to show

that the opacification is greatly reduced. In addition, they were able to demonstrate carcinomatous metastases in the liver as areas of diminished density. This was surprising, since in the case of kidney tumors, the introduction of contrast medium through abdominal aortography causes increased density within the neoplasm. It seems likely, however, that the lack of contrast in an area of metastasis, as well as throughout the liver in cirrhosis, is predicated on the compression of the sinusoids, which does not permit extension of the medium into the liver parenchyma as a whole and thereby reduces its opacification.

Percutaneous Transhepatic Portal Venography.—For the percutaneous transhepatic portal venography described by Steinbach and associates, the patient is placed in a supine position, inclined upward about 10 degrees. The epigastrium is prepared aseptically, and the tissues of the anterior abdominal wall just below the xiphoid process of the sternum are anesthetized. A 16 to 20-gage needle, 20 cm. long, is inserted through the abdominal wall. The needle is advanced through the liver until blood can be aspirated or until a depth of 15 cm. is reached, and the tributaries of the hepatic vein are entered. For venography 30 cc. of contrast medium are injected as rapidly as possible, and a roentgenogram is made immediately. This will demonstrate the intrahepatic portion of the portal vein and its branches. Percutaneous transhepatic portal venography has the following advantages over other methods of portal venography. 1. No major surgery is required. 2. The procedure can be performed in the radiographic room. 3. The intrahepatic vessels are more clearly demonstrated because the contrast material is injected directly into them. The disadvantages of the procedure are that only the intrahepatic portal venous system is demonstrated; that there has been some periportal extravasation of the contrast material with the present technique; and that a needle must be inserted through the liver parenchyma. Satisfactory venograms were made on two patients without liver disease, and in three of four patients with advanced portal cirrhosis. A venogram was obtained also in one case of metastases to the liver from a cancer of the ovary. Four venograms were unsatisfactory, one because of technical difficulties, two because the roentgen exposures were delayed until the contrast substance had passed through the liver, and the other as a result of injection of the opaque medium into the liver parenchyma. This patient experienced considerable pain. Further investigation is necessary before a final evaluation is possible.

Osseous Changes in Renal Insufficiency.—Generalized osteoporosis with or without metastatic soft-tissue calcifications, has been frequently described as a complication of chronic renal insufficiency. Davis now reports on a patient with chronic renal insufficiency who showed the opposite reaction, namely osteosclerosis. At autopsy this man, aged 68, showed chronic pyelonephritis with uremia; uremic pericarditis; diffuse osteosclerosis; congestive heart failure; old healed mitral and aortic valvulitis (rheumatic); generalized arteriosclerosis; and old syphilis. Osteosclerosis due to an osteoblastic reaction can occur in many different conditions. It has been shown in association with chronic renal insufficiency in rare instances and this entity is therefore to be added to the list of differential diagnostic possibilities when osteosclerotic changes are encountered. The present case radiographically simulated one of prostatic osseous metastases or atypical Paget's disease, but actually showed none of the classical findings of either. Postmortem examination excluded other causes for the osteosclerosis.

Rocky Mountain Medical Journal, Denver

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Malignant Melanoma. E. P. Cawley and C. E. Wheeler.—p. 323.
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Prognostic Factors in Bleeding from Gastro-Duodenal Ulceration. F. A. Barrett Jr.—p. 328.
Spontaneous Rupture of the Liver. G. L. Wright and J. M. Ball.—p. 332.
Effect of ACTH on Homologous Skin Grafts in Rabbit. F. A. Garcia. —p. 335.
Clinical Use of Antibiotics: as Determined by Simple Bacteriologic Procedures. J. R. Husted.—p. 337.

South Dakota J. Med. & Pharmacy, Sioux Falls

6:89-112 (April) 1953

Spontaneous Rupture of Normal Spleen. V. V. Volin and P. R. Billingsley. —p. 89.
Occlusion of Bifurcation Caused by Dissecting Aneurysm. R. P. Hohf. —p. 92.
Post-Operative Care of Eye Cases 25 Years Ago and Now. H. Gifford Jr. —p. 94.

Surgery, St. Louis

33:481-638 (April) 1953

Surgical Treatment of Sigmoid Diverticulitis. J. E. Lewis and A. Hurwitz.—p. 481.
Visceral Metastases from Carcinoma of Distal Colon and Rectum. H. E. Bacon and C. C. Jackson.—p. 495.
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The "Obstructed" Miller-Abbott Tube. M. Sims and B. Schaff.—p. 516.
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Cervical Intracarotid Pressure Studies: Their Significance in Management of Intracranial Aneurysms. H. C. Johnson.—p. 537.
*Transverse Incision in Pharyngeal Pulsion Diverticula. S. L. Perzik. —p. 544.
*Effect of Hyaluronidase on Experimental Exophthalmos. J. W. Nuzum Jr. —p. 550.

Transverse Incision in Pharyngeal Pulsion Diverticula.—Perzik believes that the transverse collar incision is the preferred approach in the surgical treatment of pharyngeal pulsion diverticula. It results in better exposure because of the improvement in the transverse diameter of the field, whereas the up-and-down extent is equal to that obtained with the vertical incision. The viscera of the neck can more easily be rotated in order to bring the neck of the sac into the open surgical field. In cases of miscalculation as to the side of presentation of the diverticulum, or in those rare cases of double bilateral diverticula, the collar incision can be readily extended to the other side, avoiding the making of a second vertical incision. As demonstrated in one of the cases reviewed here, lesions of the thyroid can be managed through the same incision. Finally, the cosmetic result of the collar incision is definitely superior to that of a vertical incision.

Effect of Hyaluronidase on Experimental Exophthalmos.—It has been demonstrated that exophthalmos follows increased secretion of thyroid-stimulating hormone by the pituitary. Nuzum made a series of studies to evaluate the role of water retention by the retrobulbar tissues in the pathogenesis of exophthalmos and to determine the effectiveness of hyaluronidase as a means of reversing the process. Hyaluronidase is an enzyme with the property of hydrolyzing hyaluronic acid, a mucopolysaccharide, which is a determinant of hydrophilic properties of the intercellular ground substance and the barrier role of the ground substance between cells. Increased amounts of hyaluronic acid have been demonstrated in the subcutaneous tissue in localized myxedema, and the clinical and pathological similarity of localized myxedema and exophthalmos has been recognized. Nuzum administered thyroid-stimulating hormone to intact guinea pigs and to guinea pigs from which the thyroid gland had been removed. He noted no gross difference in the degree or duration of exophthalmos in the two groups. He then injected varying amounts of hyaluronidase into the retrobulbar tissues and converted exophthalmos to enophthalmos in both groups. The duration of the enophthalmos induced was proportional to the amount of hyaluronidase injected. Enophthalmos induced in guinea pigs deprived of their thyroid developed more slowly even with higher doses of hyaluronidase than in the animals not subjected to thyroidectomy. Enophthalmos was not induced in a control guinea pig following the retrobulbar injection of hyaluronidase. The completely nontoxic character of hyaluronidase suggests its clinical trial in the management of clinical exophthalmos, although the transient effect detracts from its usefulness.

Surgery, Gynecology and Obstetrics, Chicago

96:383-508 (April) 1953

*Definitive Treatment of Saccular Aneurysms of Aorta with Excision of Sac and Aortic Suture. H. T. Bahnson.—p. 383.
Evaluation of Eosinophil Count in Patients Undergoing Major Surgery. I. Schoen, L. Strauss and M. W. Bay.—p. 403.
Graded Hepatic Arterial Ligations in Experimental Ascites. H. Laufman, A. Ross, V. M. Bernhard and others.—p. 409.
Cholecystectomy and Its Relation to Stomach and Duodenum: Review of 75 Cases with Preoperative and Postoperative X-Ray Studies. R. E. Rothenberg.—p. 421.
Multiple Peritoneal Transplantation of Splenic Tissue Following Traumatic Rupture of the Spleen. W. D. Wise.—p. 427.
Use of Latissimus Dorsi Pedicle Graft in Radical Mastectomy. H. G. Moore Jr. and H. N. Harkins.—p. 430.
Paralysis of Muscles of Chin; Surgical Treatment. H. Marino.—p. 433.
*Eosinophilic Granuloma of Vulva. D. G. McKay, R. B. Street Jr., K. Benirschke and C. J. Duncan.—p. 437.
*Urinary Excretion of Corticoids and 17-Ketosteroids Following Major Operations; Correlation with Other Aspects of Metabolism. J. D. Hardy, E. M. Richardson and F. C. Dohan.—p. 448.
Gastrojejunocolic Fistula. S. A. Localio, P. Stone and J. W. Hinton. —p. 455.
Subphrenic Abscess. J. J. Berens, H. K. Gray and M. B. Dockerty. —p. 463.
New Technique of Venography of Lower Extremities with Urokon. W. H. Boyce, J. H. Detar and S. A. Vest.—p. 471.
Metastasizing Bronchial Adenomas. R. P. McBurney, J. W. Kirklin and L. B. Woolner.—p. 482.
Metabolism of Fresh, Transplanted, and Preserved Cartilage. D. M. Laskin and B. G. Sarnat.—p. 493.

Excision of Sac and Aortic Suture in Saccular Aneurysms.—Saccular aortic aneurysms are usually caused by syphilis, and most of them occur in middle-aged patients, in whom they may be the only lesion threatening the patient's life and well-being. According to Bahnson, only two methods of treatment are currently in common use for aortic aneurysm, namely, intrasaccular wiring and the employment of fibrogenic or reinforcing materials. The former method, although beneficial to many patients, requires wire which, because of its special insulation, is no longer available. Wrapping with cellophane has given good results in isolated instances, but in a large series this technique has been helpful as palliation in only 40% of the patients. Although excision is an established method of treatment for aneurysms of peripheral arteries, it has been applied to aortic aneurysms only in isolated instances. Bahnson is convinced that excision of the sac and preservation of aortic continuity constitute the ideal treatment, since removal of the aneurysm relieves symptoms arising from pressure on nerves or vital structures and avoids later dissection or rupture. He presents the histories of eight patients who had saccular aneurysms in different regions of the aorta. In six excision of the sac and suture of the aorta were successfully carried out. The surgical technique is described, and drawings illustrate the various types of aneurysms observed in these patients and certain aspects of the operation such as the line of excision and the reconstruction after the excision. The author feels that resection of a saccular aneurysm with preservation of aortic continuity is feasible in all regions of the aorta. It is the procedure of choice in many instances.

Eosinophilic Granuloma of Vulva.—The histories of three patients with eosinophilic granuloma of the vulva are presented. After pointing out that reports of eosinophilic granuloma involving the vulva are rare, the authors show that there is evidence that eosinophilic granuloma of skin and bone, Hand-Schüller-Christian disease, and Letterer-Siwe disease are really different expressions of the same basic disease process. The same histological pattern is present in all except for certain occasional minor variations. Also, in general, each entity shows a tendency to involve certain specific tissues of the body, namely, bone, skin, lung, lymph nodes, spleen, and liver. This is probably an expression of the fact that it is a disease primarily involving the reticuloendothelial system. Numerous examples of cases depicting transitions from one of these entities into another can be found in the literature. The vulvar lesions are often symmetrical and tend to be eczematous and exudative in children but localized yellow brown tumors in adults. Eosinophilic granuloma is not confined to the younger age groups, and the disease process may be of many years' duration. When the disease produces localized swellings in the skin, these masses tend to localize around body orifices, i. e., the mouth, external auditory canal, perianal region, and vulva. The outcome in this disease is difficult to predict, but the disease tends to be shorter and oftener fatal in infants and children and of longer duration in adults. In the severe forms of the disease, treatment usually does not produce cure, but roentgen treatment or local excision may prove temporarily effective.

Urinary Excretion of Corticoids and 17-Ketosteroids Following Operations.—Hardy and associates determined urinary steroid excretion in patients before and after major operations. Excretion of corticoids was ascertained in four patients and of 17-ketosteroids in five patients and was correlated with certain aspects of nitrogen, creatinine, and electrolyte metabolism. Body temperature changes, total eosinophil counts, certain aspects of nutrition, and thyroid activity were also examined. The urinary excretion of corticoids increased in all four patients. The urinary excretion of 17-ketosteroids increased in three of five patients. There was a close inverse correlation between the total eosinophil count and the urinary excretion of corticoids following surgery. The eosinophil count decreased as the corticoid excretion increased. This consistent relationship was not observed between the total eosinophil count and the 17-ketosteroid excretion. In most patients, the postoperative increase in corticoid excretion is accompanied by an increase in the sweat potassium concentration and a decrease in the concentration of sodium and chloride. Following operation, the increases in the urinary excretion of corticoids, nitrogen, and creatinine showed similar time relationships. These increases were largely independent of changes in urinary volume.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

61:149-210 (April) 1953

Absolute Curability of Cancer of Breast and Statistical Methods of Evaluation in Follow-Up Studies, with Technical Supplement on Statistical Methods of Evaluation. C. E. Hopkin.—p. 149.
Is Radical Mastectomy Still Preferred Treatment in Operable Breast Cancer? H. E. Peters Jr.—p. 162.
Chemical Study of Human Endometrium Throughout Menstrual Cycle. C. E. McLennan and P. Koets.—p. 169.
Pregnancy in Patients with Pelvic Kidney. E. J. Krahulik.—p. 176.
Fetal Welfare in Placenta Previa. R. P. Neilson and D. R. Neilson, —p. 184.
*Urinary Stress Incontinence in the Female and Its Correction by Vesico-Urethropexy. G. H. Ward, J. C. Borel and U. E. Anz.—p. 199.
New Valve for Anesthesia Equipment. A. C. Kirchhof and H. L. Burns. —p. 201.

Vesicourethropexy in Women with Urinary Stress.—Ward and associates say that before any treatment is instituted for the correction of urinary incontinence, the exact cause must be determined. A patient should be studied and treated with the groupings of Te Linde and Brack in mind: group 1, incontinence due to defects in the urinary system, congenital or acquired; group 2, incontinence due to neurological diseases; and group 3, stress incontinence. Stress incontinence occurs most frequently and has the greatest practical importance. The six women in this series all had exertional urinary incontinence. All but one had been delivered of full-term infants. The exertional urinary incontinence had been present from three to six years. None had had previous corrective gynecological procedures. Two of the patients had had pelvic musculature re-education exercises for a period of three months each. The authors discuss the progress of these six women after their urinary incontinence was corrected by the suprapubic vesico-urethral suspension operation of Marshall, Marchetti, and Krantz. The Marchetti modification of placing the sutures to exclude the catheter was used. The Foley catheter was removed immediately in two cases, and in 48 hours in four instances; however, in each instance there was hematuria for two days despite the fact that the sutures were placed to exclude the urethra. The indwelling catheter may cause some trauma in the vesical neck. Each of these women became continent immediately after the operation and remained so to date (3 to 19 months after operation). Before the operation two of the women had to wear vulvar pads because the slightest amount of exertion caused urine to gush from the urethra. The operative procedure is relatively easy.

FOREIGN

Archiv für klinische Chirurgie, Berlin

274:255-346 (No. 4) 1953. **Partial Index**

Regeneration of Gastric Mucosa. G. Levander.—p. 255.
*Healing Processes in Phemister's Method of Subperiosteal Transplantation of Bone Splint: Evaluation of Plastic Procedures in Cases of Pseudarthroses and Retarded Healing of Shaft Fractures of the Long Tubular Bones. U. Ritter.—p. 268.
Speech After Surgical and Prosthetic Plastic Operations in Late Cases of Cleft Palate, with Special Considerations of Staphylopharyngorrhaphy According to R. Trauner. F. A. Doubek.—p. 293.
Carcinoma of Prostate: Critical Evaluation and Prospects of Conservative Cancer Therapy. R. Herbst.—p. 304.
Surgical Treatment of Congenital Cysts of the Mediastinum. P. Ganz. —p. 326.

Healing with Phemister's Method of Subperiosteal Bone Transplantation.—Ritter stresses the surprisingly favorable results obtained with Phemister's method of subperiosteal transplantation of a bone splint in the treatment of pseudarthroses and of slowly healing fractures of the long tubular bones. The fact that the healthy bone above and below the pseudarthrotic portion is only slightly separated from its periosteal trophic connection is regarded by Ritter as decisive evidence for the superiority of Phemister's over other methods. In this method the periosteum is lifted away from the bone only to permit the insertion of the piece of bone. For shaft fractures Phemister usually used bone splints from 7 to 12 cm. in length, and for those near a joint pieces measuring from 4 to 6 cm. Ritter's observations on the healing processes involved in the subperiosteal method of bone splint implantation were made on an extensive clinical material. His detailed descriptions are illustrated by roentgenograms, case histories, and diagrams. One diagram, which illustrates incorporation of Phemister's bone splint, shows marginal stretching of the periosteum and subperiosteal formation of osseous bars or clasps along the borders of the bone splint and the shaft of the bone; ossification of the pseudarthrosis takes place secondarily. Summarizing his observations, the author says that bone regeneration depends on functioning cells. Even though formation of new bone is possible through transformation of the nonspecific mesenchyma, in clinical use in human subjects a bone transplant covered with periosteum has proved superior. Phemister's method of subperiosteal implantation of a bone splint stimulates the growth potential of the healthy and eutrophic periosteum of the bone shaft. This method more than others takes advantage of the local biological conditions and requirements by early trophic attachment of the transplant, by immobilization of the old pseudarthrosis resulting from the formation of periosteal bridges between the transplant and the healthy bone shaft and by secondary ossification of the pseudarthrosis.

Archivio di Tisiologia (Scient. Sect.), Naples

8:87-164 (Feb.) 1953. **Partial Index**

Experimental Study on In Vivo Bactericidal Action of Isoniazid. G. Curci and R. Marzo.—p. 87.
Experimental Studies on Acquired Tropism in Guinea Pigs Vaccinated with BCG. G. Galzerano and A. Scozia.—p. 92.
*Thorn's Reaction After Administration of Isoniazid. R. Marzo.—p. 137.

Thorn's Reaction After Administration of Isoniazid.—Thorn's reaction (decrease of eosinophils) was studied after administration of isoniazid to ascertain whether the drug, in addition to its antibiotic action on the tubercle bacilli, also exerts a stimulating action on the adrenal cortex. About 200 mg. of isoniazid were given to 10 healthy persons and to 10 persons with tuberculosis of various forms and duration who had never had the drug before. Thorn's test gave a negative result in all these persons. This phenomenon was ascribed to the amount of drug administered, which was not sufficient to produce an effective response of the adrenal cortex. Since it was believed that any larger quantity of the drug, even in divided doses, would cause side-effects, the same dose was given for six consecutive days to the same 20 persons and, in addition, to 10 healthy persons and 7 persons with tuberculosis. On the seventh day in all but three patients the number of eosinophils had dropped more than 40% and the urinary ratio between uric acid and creatinine had increased more than 50%. In one healthy person and one with tuberculosis the drop in the number of eosinophils was only 30%, but this might have been due either to some error of method or to a mild functional deficit of the adrenal gland. In the third person in whom there was no decrease in the number of eosinophils, tuberculosis was associated with diabetes mellitus. Thus, although the study was made in a relatively small number of persons, the author, in agreement with other workers, asserts that isoniazid does exert an effective "stress" effect on the cortex of the adrenal gland.

Ärztliche Wochenschrift, Berlin

8:289-312 (March 27) 1953. **Partial Index**

*Pathogenesis of So-Called Fever-Convulsions in Early Childhood. K. Betke and R. Gädeke.—p. 295.
*Aerosolization with Isoniazid as Method of Treatment for Pulmonary Tuberculosis. R. Wagner and H. Busse.—p. 300.

So-Called Fever Convulsions in Early Childhood.—The occurrence of abnormal reactions following smallpox vaccination is reported in seven children between the ages of 1 and 12 years. In three of the seven children a postvaccinal encephalitis was suggested by clinical symptoms, neurological findings, and changes in the cerebrospinal fluid. In three other children, a tentative diagnosis of "fever convulsions" was made because of the absence of abnormal neurological findings and changes in the cerebrospinal fluid and because the temperature was rapidly restored to normal. The seventh patient had intermittent clonic spasm of the extremities, the cerebrospinal fluid was normal, and temperature was gradually restored to normal within five days. Neither the prolonged fever nor the type of spasm was characteristic of fever convulsions, but proof of encephalitis was missing. In an additional 11-month-old patient in whom a clinical diagnosis of bronchopneumonia and meningoencephalitis had been made, necropsy revealed a pronounced cerebral edema with dilatation of vessels in the brain and meninges and dilated perivascular spaces partially filled with protein. In the authors' experience autopsy of young children with a clinical diagnosis of encephalitis reveals cerebral edema oftener than encephalitis. In white mice meningeal and cerebral hyperemia with exudation of plasma into the perivascular spaces resulted from single intramuscular or peritoneal injections of large doses of corticotropin (ACTH). As a result of their clinical and experimental experiences the authors consider an increase in the volume of the brain caused by hyperemia and edema to be the morphological substrate of the so-called fever convulsions in early childhood. The cause of these cerebral changes is the nonspecific, acute adaptation of the organism to an acute infection. The convulsions may depend on predisposing factors such as unfavorable environment, age (predominantly the second to the fourth year of life), or constitutional lability of vascular reactions. "Initial infectious convulsions" seems to be the correct term for these attacks. They are a symptom that does not offer any explanation with respect to pathogenesis and is of no value with respect to prognosis. On the basis of pathological findings, the authors have considered the possiblity that such convulsions are due to a permanent impairment resulting from destruction of ganglion cells.

Isoniazid Aerosolization for Pulmonary Tuberculosis.—Forty-nine patients with open pulmonary tuberculosis were treated with 25 or more inhalations of aerosol isoniazid. Of the 49 patients, 45 received one inhalation daily and 4 received two inhalations daily of 2.5 cc. of a 2% or 2 cc. of a 5% solution of a proprietary preparation of isoniazid (Neoteben) and of 2 cc. of an equivalent 2.5% solution of another proprietary preparation of isoniazid (Rimifon). The duration of the inhalation was about 15 minutes. The total number of inhalations varied from 25 to 98, with an average of 50. In all the patients previous treatment with *p*-aminosalicylic acid or amithiozone had failed. Eight of the 49 patients were considerably improved roentgenologically by the inhalation treatments and so were 21 who had received isoniazid both orally and by inhalation; 2 of the remaining patients were moderately

improved, 17 were unchanged, and 1 became worse. The inhalations were very well tolerated. Nonspecific pharyngitis and laryngitis were not observed. Treatment had to be discontinued in three patients because of paresthesia in the extremities, tinnitus aurium, or increased serum bilirubin (2.56 mg. per 100 cc.). Better results were obtained with isoniazid aerosol therapy than with an aerosol preparation of water soluble thiosemicarbazone (Solvoteben). As a result of their experience, the authors recommend isoniazid aerosolization as an adjuvant in order to prevent increased resistance of Mycobacterium tuberculosis to isoniazid. Treatment with isoniazid orally and by inhalation alternating with amithiozone or *p*-aminosalicylic acid orally combined with thiosemicarbazone aerosol may be given a trial. Aerosol treatment should be given a trial not only in patients in whom exhaustive previous treatment with other drugs has failed but also in patients in whom stabilization could not be obtained by pneumothorax and in whom the bronchi are patent. Aerosolization does not seem to be promising with respect to the local effect in patients with residual cavities after plastic operations or if cavities are present in parts of the lungs to which the aerosol has no access as a result of the collapse.

Brain, London

76:1-148 (March) 1953

Thoughts Upon Equation of Mind with Brain. F. M. R. Walshe.—p. 1.
Tactile Thought, with Special Reference to the Blind. M. Critchley.—p. 19.
Non-Infective Intracranial Venous Thrombosis. H. J. M. Barnett and H. H. Hyland.—p. 36.
Study of Thalamic and Cortical Rhythms in Petit Mal. D. Williams.—p. 50.
Pathology of Spinal Cord Lesions and Their Relation to Clinical Features in Protrusion of Cervical Intervertebral Discs: (Report of Four Cases). W. G. P. Mair and R. Druckman.—p. 70.
Value of Electro-Encephalogram in Diagnosis of Intracranial Tumours. S. Renfrew, J. H. Cameron and I. L. Haggar.—p. 92.
Anatomical Considerations in Pathology of Stenosis of Cerebral Aqueduct. D. H. M. Woollam and J. W. Millen.—p. 104.
Neurological Features of Tsutsugamushi Fever, with Special Reference to Deafness. K. B. Noad and W. Haymaker.—p. 113.

British Journal of Dermatology, London

65:121-156 (April) 1953

Clinical Study of Leukonychia. J. C. Mitchell.—p. 121.
Investigation into Value of d,l-Alpha—Tocopheryl Acetate (Vitamin E) in Treatment of Gravitational Ulcers. M. Lee.—p. 131.
Kaposi's Varicelliform Eruption: Direct Transmission to a Nurse. J. R. Simpson.—p. 139.

British Journal of Ophthalmology, London

37:193-256 (April) 1953. **Partial Index**

Mechanism of Corneal Vascularization. N. Ashton and C. Cook.—p. 193.
Observations on Growth of Blood Vessels into Cornea: Application of New Experimental Technique. M. Langham.—p. 210.
Technique of Lamellar Scleral Resection. H. B. Stallard.—p. 223.
Protein Studies on Human Vitreous Body. B. Cagianut and C. Wunderly.—p. 229.
*Mercurialentis. D. Hunter and A. Lister.—p. 234.
Treatment of Established Symblepharon with Split Skin Homograft. G. J. Romanes.—p. 236.
Ocular Findings in Haemochromatosis. J. R. Hudson.—p. 242.
Sarcoidosis of the Eye. A. G. Cross.—p. 247.

Mercurialentis.—Hunter and Lister report on a case of mercurialentis (a colored reflex from the anterior capsule of the lens, believed to be due to a deposit of mercury) in a man, aged 58, who had been a thermometer maker for 35 years. In 1935 the bulb of a long pipe thermometer containing 2 oz (60 gm.) of mercury had burst in the man's hand, and some of the mercury had been deposited under the skin. Most of the mercury was removed at the time of the injury, but during the following week he developed ataxia and nystagmus. For two years his hand never healed completely. In 1937, a grey scarred mass was excised from the palm of the right hand. During the following two months, symptoms of mercury poisoning appeared, and he was never well from this time onward. Since 1947 he had complained of a staggering gait, of feeling unwell, and of continuous headache. Exposure to mercury ceased in March, 1948. When examined in 1951 he had vertigo, fine nystagmus, and paresis of the right external rectus muscle. On examination with the slitlamp, the lens showed a brownish, sharply defined anterior band. Examination with high power showed it to be very finely granular and to have an iridescent sheen. The authors cite several reports from the literature that indicate that mercurialentis is a common sign of prolonged exposure to mercury; it may be the only sign and once formed is permanent. Although the condition is usually of industrial origin, it can also be caused by prolonged use of yellow mercury ointment on the skin and even on the lid margins.

British Medical Journal, London

1:743-794 (April 4) 1953

The Surgeon and Ischaemia. J. Learmonth.—p. 743.
Health of Premature Children from Birth to Four Years. J. W. B. Douglas and C. Mogford.—p. 748.
Report of Tuberculin Survey in the Rhondda Fach. T. F. Jarman.—p. 754.
Chloramphenicol Treatment of the Newborn. R. M. Calman and J. Murray.—p. 759.
Summer Hay-Fever and Asthma Treated with Antihistaminic Drugs. A. W. Frankland and R. H. Gorrill.—p. 761.
Pylephlebitis and Septicaemia Treated with Aureomycin. F. G. Marson and M. J. Meynell F. Welsh.—p. 764.
Congenital Obstruction of Small Intestine in Two Premature Infants. W. P. Sweetnam, F. W. Shepherd and E. F. Murphy.—p. 765.
Succinylmonocholine. H. Lehmann and E. Silk.—p. 767.

1:795-846 (April 11) 1953

Nature and Place of Thinking in Medicine. F. Bartlett.—p. 795.
Relationship Between Cancer of Stomach and ABO Blood Groups. I. Aird, H. H. Bentall and J. A. F. Roberts.—p. 799.
Symptomatic Disturbance After Single Therapeutic Dose of X Rays: Its Relationship to General Radiation Syndrome. W. M. C. Brown.—p. 802.
*Oral N,N'-Dibenzylethylenediamine Penicillin in Children. I. A. B. Cathie and J. C. W. MacFarlane.—p. 805.
Combined Oral Penicillin and Sulphadimidine in Acute Middle-Ear Infections. D. Wheatley.—p. 806.
The Q-T Interval in Myocardial Infarction. R. B. Khambatta.—p. 808.
Chloroquine in Treatment of Amoebic Liver Abscess. J. C. Patel.—p. 811.
*"Dangerous Recipitents" of Transfusion: Incompatible Reactions after Transfusion of Group O Rh-Negative Blood. G. H. Tovey, C. P. Warren and E. E. Wood.—p. 813.
Sensitivity of Autonomic Ganglia to Hexamethonium in Hypertension. J. Conway.—p. 814.
Terramycin in Treatment of Acute Otitis Media in Children. S. Mawson, J. D. Gray and A. B. Hewlett.—p. 817.

Oral Penicillin in Children.—A new penicillin salt, Penidural (N, N'-dibenzylethylenediamine penicillin) was given orally in doses of 300,000 units to 101 children, and the blood levels of the drug were determined three to four hours after its administration. Penidural was reliably absorbed in all patients irrespective of size and weight when a standard dose of 300,000 units was used. No attempt was made to work out a graded system of dosage according to body weight, but it is possible that in the smaller children therapeutic blood levels might be obtained with smaller amounts. In acute infections blood levels obtained during the first six hours with oral administration alone cannot be regarded as adequate, and two patients with osteomyelitis and three with pneumonia who were given Penidural were also given a single intramuscular injection of a large amount of crystalline penicillin to augment the blood level during this period. In these patients the results obtained were as good as would have been expected with intramuscular administration of penicillin. A rational scheme of treatment of acute infection appears to be an initial intramuscular injection of 600,000 units of Penidural and 100,000 units of crystalline penicillin, with 300,000 units of Penidural orally, the treatment continuing thereafter only with Penidural orally. Such a scheme will produce reliable therapeutic penicillin levels and should be adequate to treat infections due to penicillin-sensitive organisms.

Transfusion Reactions.—Incompatible reactions after transfusion of group O Rh-negative blood in a 26-year-old woman and in a 42-year-old woman are reported. The first patient received the transfusion because of hemorrhage during cesarean section for delivery of her third infant; the transfused Rh-negative cells had undergone hemolysis, resulting in a severe chill followed by jaundice and oliguria for 48 hours. Laboratory investigation showed the patient's blood to be group

O Rh-positive, Rh genotype cDE/cDE; immune antibodies, type anti-e + anti-C were demonstrable in the patient's serum to a titer of 256 with homozygous e-positive red cells (Rh-negative cells, cde/cde) suspended in sodium chloride solution and in albumin. The titer against heterozygous cells (R_1R_2, CDe/cDE) was 64. The second patient received repeated blood transfusions for menorrhagia; one transfusion of group O Rh-negative blood was not followed by serious reaction, but a second transfusion nine days later caused a chill followed by jaundice, hemoglobinuria, and oliguria for the next seven days. Serological investigation demonstrated the patient's blood to be group O Rh-positive, Rh genotype CDe-CDe. Immune antibodies of the type anti-c + anti-E were demonstrable in the post-transfusion sample of her blood to a titer of 32 in sodium chloride solution and 256 in albumin against homozygous c-positive cells (Rh-negative cells, cde/cde), and 2 to 4 in sodium chloride solution and 16 to 32 in albumin against heterozygous c-positive cells (R_1r, CDe/cde). The patient's post-transfusion blood sample contained no Rh-negative cells, thus confirming that the blood transfused was incompatible. These two cases illustrate the particular risk that recipients of blood transfusions incur if they are Rh-positive, since the immune antibodies they have developed may well be of the type anti-c or anti-e, and thus active against Rh-negative corpuscles (cde/cde). In some instances incompatability from antibodies can be detected in vitro only by complicated methods of direct matching, such as an indirect antiglobulin technique or a titration procedure using bovine albumin. In neither of the author's two patients, although their histories indicated the need, had such serologic investigations been made before the transfusion accidents. The case of the second patient further illustrates that, although a patient may be transfused without serious reaction with blood of a certain ABO and Rh group, this does not mean that a later transfusion of blood of the same ABO and Rh group will be similarly unaccompanied by incompatible reaction. It is important to bear in mind that the transfusion of blood can result in formation of dangerous antibodies, and any further blood for transfusion should invariably be matched on a freshly taken sample of the recipient's serum if more than 48 hours have elapsed since a previous transfusion.

Clinica, Bologna

14:83-160 (No. 2) 1953. **Partial Index**

Nonparasitic Cysts of Liver. E. Polli.—p. 83.
C Glucoside of Digitalis Lanata in Acute Left Heart Decompensation. A. Parodi and C. Romagnoli.—p. 100.
Determination of Cholesterol and Substances with Estrogen-Like Action in Specimens of Breast Cancer. C. Menini and A. Zoli.—p. 111.
*Postoperative Study of Thrombocytes with Reference to Thromboembolic Complications. P. Serra and A. Parma.—p. 124.

Postoperative Study of Thrombocytes.—A postoperative study was made of the thrombocytes of 106 patients who, because of age and/or the type of disease that had justified the intervention, had a tendency to thromboembolic complications. The preoperative count had revealed an average of from 300,000 to 350,000 thrombocytes per cubic millimeter, varying according to the patient's disease and general condition. The first postoperative count was made 24 hours after the intervention with the patient fasting, and the others were taken every 24 to 48 hours thereafter. Seventy-six patients had an uneventful postoperative course, and 59 of them (77%) had thrombocytosis. This, as a rule, became evident 24 to 48 hours after the intervention and usually lasted less than four days. Its initial phase and duration were not correlated with the patient's disease and the type of operation. Nine of these 76 patients were not considered because they had an increase of less than 50,000 thrombocytes. In the other eight patients the number of thrombocytes remained unchanged or decreased slightly, but these findings were ascribed to some mechanical error in the method used. A pronounced thrombocytosis (two to three times greater than the preoperative values) was found in nine patients whose postoperative course was complicated by infection. When the patient began to recover, the number of thrombocytes simultaneously began to return to normal. The postoperative course of 19 patients was complicated by phlebothrombosis of the deep veins of the leg, severe thrombophlebitis, and pulmonary embolism. All but one of these revealed a thrombocytopenia that had appeared before or at the onset of the clinical signs of the thrombotic process. This thrombocytopenia occurred in various ways and lasted several days. The number of thrombocytes began to increase when the patient began to recover either spontaneously or with ethyl biscoumacetate (Tromexan) and heparin therapy. In two patients whose postoperative course was complicated by infection and thrombosis concurrently there was no change in the number of thrombocytes. This suggests that the effect of the two entities on the thrombocytes superimposed and annulled each other. Since a more or less pronounced thrombocytopenia was a constant phenomenon in patients whose postoperative course was complicated by a thromboembolic process, a postoperative study of the patient's thrombocytes may be a valuable adjuvant in the early diagnosis of these complications. It may prove especially valuable when these processes develop in areas that are clinically difficult to explore, such as the pelvic and femoral vessels and the chambers of the heart.

Deutsche medizinische Wochenschrift, Stuttgart

78:451-502 (April 3) 1953. **Partial Index**

Surgical Treatment of Pyloric Ulcer: Gastroenterostomy with "Conservative" Exclusion of Pylorus in Ulcers at the Pylorus Where Resection is not Feasible or Difficult. E. Borchers.—p. 451.
Progress in Surgical Treatment of Esophagus. H. Krauss.—p. 455.
Treatment of Bronchiectasis by Resection. E. Derra and F. Koss.—p. 457.
Changes in Knowledge of Pathogenesis and Treatment of Acute Suppurative Osteomyelitis. T. Naegeli.—p. 462.
*Anemia Associated with Diaphragmatic Hernia. F. Kümmerle.—p. 487.

Anemia Associated with Diaphragmatic Hernia.—The occurrence of hypochromic anemia in two women, aged 50 and 61 years, with diaphragmatic hernia is reported. In the younger patient the anemia was mild and occult blood was demonstrated in the feces; the older patient had severe anemia (with a hemoglobin level 26% of normal) and large amounts of blood were found in the feces. In the first patient the diaphragmatic hernia was acquired, there was no hernial sac, and the condition probably was due to a sudden increase of the internal abdominal pressure. The second patient had a hiatus hernia of type 2 according to Akerlund's classification, with a shortened esophagus that opened into the epiphrenic sac of the stomach. On surgical intervention in both patients an ulcer was detected in the cardial portion of the stomach at the level of the hernial aperture; it had not been demonstrated roentgenologically before the operation. This ulcer was the cause of the anemia. Pathogenesis, symptomatology, and diagnosis are briefly discussed. The severe anemia in the older patient improved considerably following preoperative treatment with large doses of iron and blood transfusions. Surgical treatment by the transthoracic approach was successfully carried out in both patients and should be practiced in all cases of diaphragmatic hernia associated with anemia, provided there are no clear contraindications. Because it restores anatomic conditions, it is the method of choice in traumatic diaphragmatic hernia. Phrenicotomy with or without thoracotomy may be performed for hiatus hernia with shortened esophagus; the dilated hiatus of the diaphragm may be narrowed by suturing the diaphragm to the prevertebral fascia and fixing the edges of the narrowed hiatus at the stomach at the level of the cardia. Because of the frequent association of anemia with diaphragmatic hernia, the presence of the latter always should be considered in cases of anemia of uncertain origin.

Gazzetta Medica Italiana, Milan

112:65-96 (March) 1953. **Partial Index**

Action of "Formo-cibazol" Combined with Vioform on Intestinal Amebiasis: Clinical and Experimental Studies. F. Andrini and S. Arcanà.—p. 65.
Pernicious Anemia Associated with Cirrhosis of Liver: One Case. G. C. Angela and M. Fazio.—p. 68.
*Intra-Arterial Therapy of Endarteritis Obliterans. R. Marinoni.—p. 77.

Intra-Arterial Injection of Antazoline in Endarteritis Obliterans.—Ten patients with thromboangiitis obliterans of varying duration were treated with intra-arterial injections of 0.1 gm. of antazoline (Antistine) hydrochloride combined with 10 cc. of

a 1% procaine hydrochloride solution. The injection was given slowly in Scarpa's triangle and immediately thereafter a band was tied around the thigh for five minutes. A total of from 3 to 12 injections proved sufficient to bring about an improvement in all but one patient. In this patient, a 43-year-old man, thromboangiitis was associated with lesions secondary to frostbite, and after seven injections his condition was still unchanged. All the other patients reported a marked diminution of nocturnal pains, a 9 to 10 times greater walking endurance before onset of pains in the extremities, a diffuse sensation of warmth in the entire leg with profuse sweating of the foot for from one-half to two hours after the injection, and at the time of the injection an unpleasant, warm, burning sensation radiating to the great toe. This sensation was not felt by the patient in whom the therapy failed. There was never any side-effect, and only three patients were hospitalized for the treatment. The improvement is still present in all the nine patients 40 days to 8 months after the end of the treatment. Although the author cannot as yet explain the mechanism of action of antazoline in these patients, he suggests that the presence of the histamine-antagonizing agent in an optimum concentration in the altered vascular tissue is effective in inactivating the histamine produced by the tissue and bringing about, even if only temporarily, a balance.

Journal of Irish Medical Association, Dublin

32:95-132 (April) 1953

The Case for Gastrectomy. J. Hurley.—p. 95.
Unusual Lesions in Right Iliac Fossa. P. C. Bresnihan and K. Jones.—p. 106.
*Femoral Nerve Lesion in Haemophilia. J. B. Lyons.—p. 110.
Use of Radio-Active Isotopes in Radiotherapy. D. J. Riordan.—p. 112.
Cancer: Preventive Approach. H. V. Connolly.—p. 115.
Ménière's Syndrome and Simulating Conditions. F. A. MacLaughlin.—p. 116.

Femoral Nerve Lesion in Hemophilia.—Certain complications of hemophilia, such as hemarthrosis, occur so frequently that absence of hemarthrosis in a hemophilic patient surviving into adult life casts doubt on the diagnosis. Involvement of the nervous system, however, is rare, as is proved by a review of the literature. Lyons describes a youth, aged 19, who had been hospitalized on many occasions for bleeding episodes. One maternal uncle died of hemorrhage when 12 years old. Another was "subject to bleeding." His brother was a bleeder from birth and died from hemorrhage at the age of 3 years. The youth's complaint was of pain in the left hip, and pain and swelling in the left groin. He also complained of tingling and numbness on the lateral side of the left thigh. His left hip was held in flexion and a large hard mass was palpable just above the inguinal ligament. He was unable to extend his left knee, and the quadriceps muscles were flaccid and wasted. The left knee jerk was absent. There was extensive sensory loss for pin prick and light touch in the area supplied by the femoral nerve and the lateral cutaneous nerve of the thigh. Aspiration of the hematoma deep in the psoas muscle was done a month later, because its size had shown no change. The pain in the iliac fossa was somewhat relieved after this, but no change was noticeable in the function of the involved nerves until about 7 months later. Then a transient disturbance in the radial nerve developed. In quoting from a summary report on nerve lesions in hemophilia, the author says that the femoral nerve was affected in 7 of 11 patients with involvement of the peripheral nerves. Diagnosis should present no difficulty provided the possibility of a peripheral nerve lesion is considered; however, on account of psoas spasm and pain referred to the hip joint, it may be mistaken for hemarthrosis in this joint. Further examination will reveal the inability to extend the knee, the loss of the knee-jerk, and extensive sensory loss. A mass is always present in the iliac fossa, pointing to the cause of the paralysis, a large hematoma in the psoas muscle. The prognosis is on the whole good, with the majority of patients recovering completely.

Journal Obst. & Gynaec. Brit. Empire, Manchester

60:141-300 (April) 1953. Partial Index

Maternal Placental Blood Flow in Normotensive and Hypertensive Women. J. C. McClure Browne and N. Veall.—p. 141.
Placental Polysaccharide and Aetiology of Toxaemia of Pregnancy. M. Kaku.—p. 148.
*Glomerular Filtration Rate and Renal Blood Flow in Hypertensive Toxaemia of Pregnancy. H. Bucht and L. Werkö.—p. 157.
Study of Renal Tract in Carcinoma of Cervix. R. Dearing.—p. 165.
Blood-Pressure in Toxaemia of Pregnancy: I. Spontaneous Diurnal Variability. L. Werkö and S. Brody.—p. 180.
Id.: II. Influence of Hypotensive Drugs. L. Werkö and S. Brody.—p. 186.
Exchange of Sodium Between Plasma and Extracellular Compartments in Pregnant Women as Determined by Na^{24} Tracer Methods. L. W. Cox and T. A. Chalmers.—p. 195.
Transfer of Sodium to Placental Blood During Third Stage of Labour Determined by Na^{24} Tracer Methods. L. W. Cox and T. A. Chalmers.—p. 226.
Giant Cell Tumour of Bone in Pseudomucinous Cystadenoma of Ovary. H. F. Bettinger.—p. 230.
Intra-Uterine Growth of Foetal Head after 36th Week of Pregnancy. D. Crichton.—p. 233.
Vaginal Delivery After Caesarean Section. R. F. Lawrence.—p. 237.
Composition of Liquor Amnii in Haemolytic Disease of Newborn. D. C. A. Bevis.—p. 244.
Masculinization of Ovarian Origin: Report of Case with Virilization Developing During Pregnancy. W. S. Alexander and O. D. Beresford.—p. 252.
Crush Fracture of Dorsal Spine in Eclampsia. O. V. Jones.—p. 259.

Glomerular Filtration and Renal Blood Flow in Toxemia of Pregnancy.—According to Bucht and Werkö, the kidney has been thought to play an important part in the development of toxemia of pregnancy, but a change in renal function pathognomonic for toxemia of pregnancy has not been demonstrated. Several investigators using clearance techniques studied the changes in renal function during toxemia. The studies reported here also concerned the clearance techniques and compare the values found in normal pregnancy with those found during toxemia of pregnancy. The renal clearance of inulin and *p*-aminohippuric acid was studied in 28 cases of toxemia of pregnancy. In all cases the study was repeated once or twice after termination of pregnancy, up to two years after delivery. The authors found that inulin clearance is the best measure of the glomerular filtration rate and the *p*-aminohippuric acid clearance of the renal plasma flow in toxemia of pregnancy. Inulin clearance is lower than normal in toxemia of pregnancy, but it undergoes a rapid increase after delivery. This speaks against organic changes as a cause of decreased filtration rate. Other possible causes are discussed. The *p*-aminohippuric acid clearance is also lower than normal in toxemia of pregnancy. The *p*-aminohippuric acid clearance does not increase to normal immediately after delivery but increases slowly and in some cases not at all. In the latter cases arterial hypertension does not necessarily develop within the time of observation (two years). The filtration fraction did not show typical changes in toxemia of pregnancy. There was no correlation between the extent of renal changes and the death of the fetus.

Journal of Tropical Medicine and Hygiene, London

56:73-98 (April) 1953. Partial Index

Filiariasis in Tropical Asia. D. L. Augustine.—p. 75.
Dengue Epidemics in Japan, 1942-1945. S. Hotta.—p. 83.

Klinische Wochenschrift, Berlin

31:297-344 (April 1) 1953. Partial Index

Endogenous Creatinine Clearance in Persons Without Renal Disease. P. Doering, H. Schroeter, W. Schubert and M. Schwab.—p. 301.
Treatment of Pemphigus Vulgaris with Heparin. M. Matthes.—p. 305.
Action of Insulin Administered in Form of Aerosol. B. Knick and J. Wehr.—p. 310.
*Influence of Vitamin B_{12} on Levulose Content of Blood. K. Stuhlfauth.—p. 312.
Electroshock and Sympathetic Integration. S. Wieser, R. Fetzner and D. Jordan.—p. 314.
Serum Protein Values in Patients with Carcinoma. H. Esser, F. Heinzler and H. Wild.—p. 321.

Influence of Vitamin B_{12} on Levulose Content of Blood.—Steinitz reported in 1937 that the increased blood levulose concentration that results from the administration of levulose can be reduced by administration of liver extract. Stuhlfauth

noted that the same effect could be obtained when, instead of liver extract, he administered from 15 to 30 μg of vitamin B_{12} intramuscularly after levulose had been given either intravenously or by intraduodenal drip. Stuhlfauth was interested in ascertaining whether this reduction in the blood levulose content, which he had obtained in 30 subjects, including some with hepatic disorders and with obesity, would also influence other constituents of the carbohydrate metabolism. For this purpose levulose was introduced into the duodenum of 10 fasting persons. When 1 liter of 5% levulose solution was given hourly, the blood levulose concentration was found to be between 30 and 50 mg. per 100 cc. after about 120 minutes and remained at this level when the levulose administration was continued at the same rate. The dextrose content, however, was found to decrease by from 10 to 20 mg. per 100 cc. The lactic acid did not noticeably increase with this relatively slow administration of levulose. The pyroracemic acid was usually only slightly increased (0.5 mg. per 100 cc.), and the inorganic phosphate decreased slightly (2 mg. per 100 cc.). If, after the levulose content has reached its maximum, that is, two hours after onset of infusion, the patient is given 30 μg of vitamin B_{12}, the levulose nearly always decreases by from 10 to 25 mg. per 100 cc. The blood dextrose then increases slightly, without reaching the former level. Lactic acid usually increases noticeably, sometimes to twice its original value, one hour after injection of vitamin B_{12}. The pyroracemic acid decreases following a slight temporary increase. The inorganic phosphate one hour following the injection of vitamin B_{12} shows a renewed increase, which is followed by a temporary decrease. The reduction in the blood levulose content occurs only after injection of vitamin B_{12} or of liver extracts. Cobalt, folic acid, and adrenal cortex extract did not have this effect on the levulose content of the blood. Administration of 30 μg of vitamin B_{12} to eight fasting healthy persons who had not been given levulose likewise showed a slight decrease in the general function of reduction. In five patients with diabetes no uniform changes could be observed. The author concludes that the changes appearing simultaneously in the serum contents of dextrose, pyroracemic acid, and inorganic phosphate indicate that vitamin B_{12} induces increased utilization of levulose.

Lancet, London

1:657-704 (April 4) 1953

*Synergistic Action of Liquorice and Cortisone in Addison's and Simmonds's Disease. J. G. G. Borst, S. P. ten Holt, L. A. de Vries and J. A. Molhuysen.—p. 657.

*Effects of Liquorice and its Derivatives on Salt and Water Metabolism. W. I. Card, W. Mitchell, J. A. Strong and others.—p. 663.

Trichomonas Vaginalis in the Male: Experimental Infection of Volunteers. F. Lanceley and M. G. McEntegart.—p. 668.

Cuirass Respirators: Their Design and Construction. J. T. Scales, A. B. K. Wilson, T. H. Sellors and others.—p. 671.

Modified Both Respirator. R. E. Smith.—p. 674.

P-Q Variation in Influenza Viruses. A. Isaacs.—p. 676.

Disorders of Motility of Small Bowel. I. W. MacPhee.—p. 678.

Whale Finger and Seal Finger: Their Relation to Erysipeloid. F. K. M. Hillenbrand.—p. 680.

1:705-754 (April 11) 1953

Professionalism in Heath Service. L. Farrer-Brown.—p. 705.

Immediate Primary Repair of Skin Defects with Local Flaps. C. R. McLaughlin.—p. 710.

Polycythaemia and Erythraemia Treated with Para-Hydroxypropiophenone. E. Haynal, F. Gráf and E. Matsch.—p. 714.

Mechanism and Treatment of Spinal-Cord Disorders Associated with Cervical Spondylosis. A. R. Taylor.—p. 717.

Renal Excretion of Phenolsulphonphthalein as Aid to Diagnosis of Previous Hypertension. J. Vallance-Owen.—p. 721.

New Respirator. C. Bang.—p. 723.

Biological Activity of Triiodothyronine. E. G. Tomich and E. A. Woollett.—p. 726.

Licorice and Cortisone in Addison's and Simmonds' Disease.—Some of the adrenal cortical hormones influence the renal function in that they promote retention of sodium, chloride, and water but cause greater excretion of potassium. When administration of these hormones is stopped, there is a "rebound"; potassium is retained and extracellular fluid is excreted in excess. Desoxycorticosterone possesses this property to a greater degree than the glycocorticoids, cortisone and hydrocortisone. It was demonstrated in 1950 that oral administration of extract of licorice or of the glycyrrhizinic acid obtained from it, has the same effect as administration of desoxycorticosterone. Borst and associates of Amsterdam discuss the response to licorice in patients with Addison's disease and in Simmonds'-Sheehan disease, citing case histories. They found that the desoxycorticosterone-like effect of licorice, which is always seen in persons with intact suprarenal glands, was absent in three patients with Addison's disease. One of the three had suffered from suprarenal insufficiency for only a short time and had at first reacted well to licorice. In these three patients administration of 2.5 mg. of cortisone daily, divided into eight doses, partially restored the effect of licorice on the mineral metabolism. A dose of 10 mg. of cortisone restored the effect fully. A patient with Simmonds'-Sheehan disease reacted favorably to licorice. A good response followed treatment either with licorice and cortisone or with licorice and corticotropin. Two of the patients with Addison's disease who were treated with licorice and corticotropin simultaneously failed to respond. It is probable that patients with Addison's disease who respond favorably to licorice still have remnants of functioning suprarenal tissue, but there is as yet no direct evidence of this. The authors say that their observations throw no light on why the effect of licorice in normal subjects varies so much. The intensity of the response is not determined by the amount of glycocorticoids produced by the suprarenal glands unless this falls below a certain level. At the moment the most attractive hypothesis is that the "weak reaction" of certain subjects is merely the consequence of a very active counteracting homeostatic mechanism.

Effects of Licorice on Salt and Water Metabolism.—Following reports that in one case Addison's disease was controlled with licorice and in another case with salts of glycyrrhizinic acid, a component of licorice, Card and associates investigated these effects and examined certain components of licorice for desoxycorticosterone-like activity. They found that block juice, a preparation of crude licorice, is capable of producing water, sodium, and chloride retention in normal persons. Glycyrrhetinic acid, which occurs in licorice in the form of its glucuronide (glycyrrhizinic acid), reproduced the effects of crude licorice in normal subjects. Glycyrrhetinic acid, when given to one patient with Addison's disease, had effects on weight and electrolytes similar to those found after the administration of desoxycorticosterone and cortisone. In contrast to desoxycorticosterone, crude licorice and glycyrrhetinic acid did not prolong the survival of rats whose adrenals had been removed.

Medical Journal of Australia, Sydney

1:357-392 (March 14) 1953

One Thousand Complete Pelvimetries: Radiological and Obstetrical Analysis. C. Macdonald and S. Thomas.—p. 357.

*Treatment of Tetanus. E. G. Saint, R. A. Joske and J. L. Stubbe.—p. 361.

Zinc Sulphate Turbidity Test in Differential Diagnosis of Jaundice. S. Weiden.—p. 364.

Temporal Lobe Tumours. J. Game.—p. 366.

Medical Selection of Migrants from Displaced Person Population of Post-War Europe. I. R. Mackay.—p. 369.

Some Observations on Use of "Brevidil E," New Muscular Relaxant, in Electro-Convulsive Therapy and Comparison with "Scoline." V. T. Stephen.—p. 372.

Bilateral Congenital Anterior Staphyloma Treated by Keratoplasty. H. C. Beckett.—p. 372.

Neuroblastoma of Naso-Pharynx. G. K. Vincent.—p. 374.

Treatment of Tetanus.—In past decades the treatment of tetanus was often disappointing, because even heroic doses of antitoxin may be without value once the toxin is fixed in central nervous tissue and florid symptoms have developed. This paper reports observations on six patients with tetanus, four of whom recovered. The authors are convinced that in all but the mildest cases treatment of tetanus should consist of an integrated therapeutic attack designed to keep the patient alive while the effects of the toxin wear off. The neutralization of toxin, suppression of exhausting spasms, the prevention of bronchopneumonia, and the maintenance of an optimal state of nutrition are of vital importance. The following meas-

ures should be adopted: 1. At least 250,000 units of antitoxin should be given on the patient's admission to hospital, half of this by the intravenous route. 2. Early tracheotomy should be performed as a routine measure. 3. Every six hours 500,000 units of penicillin and 0.5 gm. of streptomycin should be given. 4. If a wound is present, early wide excision should be carried out. 5. Continuous intragastric feeding should be instituted. 6. Continuous administration of gallamine (Flaxedil) triethiodide should be carried out by intravenous drip. 7. Minimal sedation with short-acting barbiturates, such as thiopental (Pentothal), should be used. In severer cases it may be necessary to keep the tracheotomy tube in place for two or more weeks and to continue with the intravenous use of gallamine triethiodide for a similar period.

Nordisk Medicin, Stockholm

49:387-420 (March 13) 1953. Partial Index

Chylothorax. R. Dybkaer.—p. 387.
Two New Cases of Chylothorax. R. Gordin.—p. 390.
Anticoagulants in Cardiac Infarction. R. Gordin.—p. 393.
Clinical Application of Nor-Epinephrine. O. Norlander.—p. 395.
Allen's Test in Arterial Insufficiency: Clinical Evaluation. O. Selvaag. —p. 399.
Follow-Up of Patients with Varicose Veins Treated by Mosckowicz Operation. L. Zachariae.—p. 400.
*Effect of Probenecid on Penicillin Content of Serum After Oral Administration of Penicillin. A. R. Frisk, N. Diding and G. Wallmark.—p. 402.
Subacute Bacterial Endocarditis-Mycotic Aneurysm in Popliteal Artery. J. T. Heggebø—p. 405.
Dicumarol in Recurrent Thrombophlebitis. B. Swedberg.—p. 408.
Prostigmine in Acute Porphyria. H. Öigaard and B. E. Roos.—p. 411.

Effect of Probenecid on Penicillin Content of Serum After Oral Administration.—Frisk and his associates report that the simultaneous administration of probenecid and penicillin noticeably increases the serum concentration of penicillin compared with the concentration reached by corresponding amounts of penicillin alone. With dosage of from 0.25 to 1 gm. of probenecid there is a linear relationship between the amount of probenecid given and the serum penicillin level attained. With the aid of probenecid, oral penicillin therapy can be carried out with smaller penicillin doses given at longer intervals. A dosage scheme of 500,000 units penicillin together with 1 gm. of probenecid every eight hours gives a minimum penicillin level in the serum of 0.1 unit per milliliter. The toxicty of probenecid is low and the substance is well tolerated. The present method of administering penicillin will probably largely be replaced by oral penicilln-probenecid therapy. An oral dose of 500,000 units penicillin with 1 gm. of probenecid every twelve hours may be considered sufficient for the treatment of most infectious diseases due to penicillin-sensitive bacteria. The combination of penicillin and probenecid in one tablet simplifies administration and does not affect the resorption of the substances. Probenecid will also be valuable in the treatment of infections that respond only to massive penicillin therapy; the authors' experiences in treatment of subacute bacterial endocarditis show the effectiveness of the combination of massive intramuscular doses of penicillin and probenecid.

49:459-492 (March 27) 1953. Partial Index

Isoniazid in Tuberculous Meningitis. L. Silverstolpe and G. Örndahl. —p. 459.
Refsum's Disease. L. Kjellson.—p. 460.
*Experiments with Small Doses of Succinylcholine Iodide in Electroshock Therapy. G. Holmberg, G. Hård and N. Ramqvist.—p. 463.
Excretion of 17-Ketosteroids in Alcoholism. S. Mårtens.—p. 466.
Renal Function in Diabetes Mellitus. H. Bucht, L. Werkö and J. Ek. —p. 468.
Isoniazid in Tuberculous Meningitis: Case Report. L. Silverstolpe and G. Örndahl.—p. 470.

Use of Succinylcholine Iodide in Electroshock Therapy.—Experimental and clinical studies were carried out to determine a practical standard dose of the muscle relaxant, succinylcholine iodide, for use in electroshock treatment. Electromyographic recording of the convulsions after different doses of this agent showed 0.25 mg. per kilogram of body weight to be suitable for men and 0.15 mg. per kilogram for women. Succinylcholine iodide was combined with 0.15 gm. or in exceptional cases with 0.20 gm. of Evipan (N-methylcyclohexenyl-methyl barbituric acid) and injected intravenously over a period of one minute while oxygen was insufflated. The electroshock was given about 20 seconds after the end of the injection. Clinical tests in 74 patients, 32 men and 42 women, in 339 electroshock treatments showed noticeable reduction of the severity of the convulsions in almost all cases. Few skeletal and no other unfavorable reactions occurred. The postconvulsive apnea rarely lasted longer than 30 seconds and never longer than a minute and a half. The only measure necessary in these cases was insufflation with oxygen for at the most one minute. Patients who have fragile bones or are otherwise feeble may require larger doses. If considerably larger doses of succinylcholine iodide are given, the simpler anesthesiologic methods of keeping the air passages open must be mastered. Holmberg and his co-workers conclude that because of variations in individual sensitivity to the muscle-relaxing substance and in skeletal and muscular strength no generally applicable standard dose can be set that will in all cases protect against injury and never cause respiratory arrest, but by individualization and adjustment of the dose the aim can be more nearly realized. During the last six months about 1,000 treatments were given along the lines indicated, without skeletal, respiratory, or other complications.

Philippine Medical Association Journal, Manila

29:47-104 (Feb.) 1953. Partial Index

Problems of Our Disabled Workers. J. S. Santillan and A. A. Gorospe. —p. 47.
Is Appendicitis Still a Surgical Problem? Presentation of Non-Localizing Acute Appendicitis. F. C. Guzman.—p. 57.
Intravenous Oxytocics in Labor. J. C. Delgado.—p. 67.

Policlinico (Pract. Sect.), Rome

60:297-332 (March 2) 1953. Partial Index

Asthma and Pregnancy. G. Rossi.—p. 297.
*Blood Withdrawal by Catheterization of Right Heart in Treatment of Acute Pulmonary Edema. L. Provenzale.—p. 304.
Syndrome Produced by Use of Electroshock with Electronarcoshock Therapy. P. Paladini.—p. 313.

Blood Withdrawal From Heart of Patients with Pulmonary Edema.—Provenzale reports on four patients with secondary pulmonary edema in whom, all treatments having failed, he removed blood from the heart by means of a catheter introduced into the right atrium. The first patient was a 64-year-old man in whom severe pulmonary edema followed pneumonectomy for carcinoma of the right lung. The removal of about 350 cc. of blood from the cubital vein and administration of morphine and other drugs were unsuccessful. His general and local condition improved greatly, however, when a catheter was placed into the right atrium through the basilic vein and 375 cc. of blood were withdrawn slowly. The second patient was a 51-year-old man in whom edema developed after pneumonectomy for neoplasm of the left lung. On the seventh postoperative day, all treatment having failed to relieve the edema, a catheter was introduced into the right atrium. The pressure was 20/6 mm. Hg in the atrium, 80/18 mm. Hg in the right ventricle, and 80/22 mm. Hg in the pulmonary artery. The values before pneumonectomy were 11/2, 40/5, and 40/16 mm. Hg, respectively. About 330 cc. of blood were removed, and the patient's condition was much improved. One month later the pressures within the heart and the pulmonary artery were normal. In both patients the improvement began after about from 100 to 150 cc. of blood had been removed. When, without removal of the catheter, the withdrawing process was stopped at this point, dyspnea and edema reappeared within a few minutes. In the other two patients edema was secondary to lesions of the mitral valve. This procedure failed in one of them because it was used in extremis. In the other it caused regression of the edema, but the patient died 11 days later of a cerebral embolism. To better ascertain the mechanism of action of this method, the author made experiments on three groups of rabbits. All of them were given an intravenous injection of 1 mg. of epinephrine per kilogram of body weight to produce pulmonary edema. Then 30 to 35 cc. of blood were withdrawn from a peripheral vein of the animals of the first group. All of them died from the

pulmonary edema, which was confirmed at autopsy. When from 30 to 50 cc. of blood were removed from the right side of the heart of the animals of the second group, only 50% of them died. Autopsy revealed a mild edema and suggested that death was probably due to the acute anemia that followed the removal of blood. The withdrawal of from 60 to 80 cc. of blood from the right side of the heart of the animals of the third group and reintroduction of the blood into the right femoral artery saved all the animals except one. Two hypotheses are advanced to explain the mechanism of action of intracardiac blood removal from patients with pulmonary edema secondary to lung surgery or to heart disease. Either the excess flow to the lungs is decreased or a more normal ratio is established between the volume of blood in the systemic circulation and that in the pulmonary circulation. The author favors the second hypothesis, since removal of blood directly from the right side of the heart would, as a rule, reduce congestion of the pulmonary circulation better than removal of peripheral blood.

Presse Médicale, Paris

61:381-400 (March 18) 1953. **Partial Index**

*Researches into Cultivation of Koch's Bacillus from Laryngeal and Pharyngeal Mucus Specimens Obtained by Swabs. A. Saenz, Jr.—p. 381.
Attitude Tremor. M. Bonduelle.—p. 382.
Recent Methods of Artificial Respiration. A. Djourno.—p. 385.
Scleroderma. B. Duperrat.—p. 387.
Gastrectomy in Ulcers Situated Very High in Stomach. J. Duval.—p. 389.

Cultivation of Koch's Bacillus from Laryngeal and Pharyngeal Swabs.—The sensitivity of the laryngeal and pharyngeal swab method of cultivation as compared with that of other routine methods used in detecting Koch's bacillus was studied in 100 patients at the Institute of Phthisiology at Montevideo. Control tests by direct examination and examination of gastric washings and sputum were made for each patient, followed by cultivation of material obtained on the same day by the use of laryngeal and pharyngeal swabs. Results were in agreement in 88 cases, 46 of which were negative and 42 positive. They disagreed in 12 cases, two being positive by the control tests and negative by the swab method and the other 10 being negative by the control tests and positive by the swab method. Inconvenience for the patient is minimal; fasting is not necessary and specimens may be taken at any hour of the day. The swabs, after having been used dry in order to collect as much material as possible, are treated first with sulfuric acid and then with sodium bicarbonate according to Adler's technique. The bacilli are cultivated on solid mediums, and secondary bacterial contamination seldom occurs. The whole procedure is simple and rapid, and may be used either for detecting new cases or for evaluating the effects of therapy in old ones.

61:423-462 (March 25) 1953. **Partial Index**

Biopsy Puncture of Liver and Pigmentary Cirrhosis. P. Harvier, J. Di Mattéo and J. Bescol-Liversac.—p. 423.
Leukosarcomatosis with Initial and Predominant Skin Changes. R. Poinso, H. Payan, E. Calas and Y. Carcassonne.—p. 433.
*Assessment of Treatment of Vitiligo with Ammi Majus. E. Sidi and J. Bourgeois-Gavardin.—p. 436.
Drainage of Wirsung's Canal in Acute Pancreatitis. L. Leger and J. Lataste.—p. 445.
Y-Shaped Vascular Graft for Traumatic Aneurysm of Brachio-cephalic Trunk. J. Oudot, R. Rogé, G. Delahaye and J.-M. Cormier.—p. 449.

Treatment of Vitiligo with Extract of Ammi Majus.—Patients with vitiligo may be treated with extracts of ammi majus given internally in tablet form and concurrently applied locally in a solution, or by either of these methods alone, combined with exposure to the sun or to ultraviolet rays. Irradiation is indispensable to repigmentation; pigmentation never appears in nonirradiated plaques. The results vary according to the patient's age and race; the duration, form, and site of the disorder; the regularity of the treatment; and, especially, the nature of the irradiation (the wave lengths should be between 2,900 and 4,077 Å.). Young children and adolescents, even those with extensive lesions, respond much more rapidly than adults. The rapidity of the response in all patients is directly related to the frequency of the irradiations; when the lesions are irradiated daily, repigmentation appears promptly and increases progressively. Tolerance for the medication taken internally is good; nausea, insomnia, and nervousness may occur, but soon disappear or diminish. The drug is available in 7.5 mg. tablets of xanthotoxine (ammoidine) and 2.5 mg. tablets of Impératorine (ammidine). It should not be given to patients with hypertension, hepatic disorders, or cardiac or renal insufficiency because repeated doses have a toxic effect on the liver. Dosage consists of 3 or 4 tablets a day (½ to ¾ mg. per kilogram of body weight), and patients are instructed to discontinue ingestion of the drug for one week each month. Normal alcoholic solutions contain 10 mg. of xanthotoxine or 5 mg. of Impératorine per cubic centimeter, while weak solutions contain half as much. Periods of irradiation must not exceed one-fourth to one-half minute at first, and should be increased very gradually. Lesions on exposed surfaces must be protected from light following irradiation. The results of the treatment are greatly influenced by the length of time between the application of the solution and the irradiation; the more time the solution has to penetrate the skin, the greater is its photocatalyzing effect. Local application may produce photosensitization or phototrauma. Phototrauma, which is caused by overexposure and occurs 24 to 72 hours after irradiation, is characterized by erythema, with or without edema, and blisters. Fever (40 to 41 C), nausea, vertigo, headache, and transient anuria may also be present. Treatment may be resumed after the subsidence of these reactions, which occurs rapidly under local care. Photosensitization, on the contrary, is an absolute contraindication to local application of ammi majus; it is infrequent, but should be recognized, because the eczema it causes may become generalized. Ammi majus therapy has produced a favorable response in 84 of 106 patients treated in the last two years: 7 are cured, 10 almost completely repigmented, 17 improved, and 50 show signs of repigmentation.

Proceedings of Royal Society of Medicine, London

46:139-218 (March) 1953. **Partial Index**

Some Effects of Intense Sound and Ultrasound on the Ear. E. D. D. Dickson.—p. 139.
Discussion on Future Role of Occupational Therapy in Rehabilitation. C. B. Wynn Parry.—p. 185.
Chronic Changes in Central Nervous System Following Thorotrast Ventriculography. R. Hughes.—p. 191.
Streptococci of Mouth and Their Relationship to Subacute Bacterial Endocarditis. E. D. Farmer.—p. 201.
Ocular Actinomycosis. C. H. Smith.—p. 209.
Macular Degeneration Treated with Cortisone. H. E. Hobbs.—p. 213.

Sang, Paris

24:205-300 (No. 3) 1953

*New Method of Diagnosis for Hemophilia: Assay of Antihemophilic Factors A and B. J.-P. Soulier and M.-J. Larrieu.—p. 205.
Physiopathology of Acute Leukemia Under Treatment. J. Bernard and G. Mathé.—p. 216.

Assay of Antihemophilic Factors A and B in Hemophilia.—Patients with hemophilia may be divided into two groups: (1) those lacking the classic antihemophilic factor, A, and (2) those lacking a new factor, B, that possesses the same characteristics as that called the plasma thromboplastin component by Aggeler and associates, that described by Schulman and Smith, and that identified by Biggs and co-workers as the "Christmas factor." Prothrombin consumption and heparin tolerance are disturbed in all the anomalies affecting the first stage of coagulation; consequently, tests based on these functions are not specific for hemophilia. A new test provides a simple, specific, and sensitive method of determining antihemophilic activity of either type A or B. It is simple, because the reagents are always available; specific, because variations due to platelets are eliminated; and sensitive, because changes in the antihemophilic factors, which are disturbed even in mild forms of genuine hemophilia, are clearly reflected. In the test for factor A the following reagents are used: (1) human hemophilic plasma deficient in factor A and freed from platelets and thromboplastin by prolonged centrifugation at a low temperature (reagent A); (2) a platelet extract deprived of antihemophilic activity (A) by being kept at a temperature of 38 C for 30 minutes; and (3) the plasma to

be tested diluted 1:20 with isotonic sodium chloride solution or a buffered medium immediately before the test. Control plasma is prepared in the same manner. Four tubes, placed in a water bath at 37 C, are filled as follows: (1) 0.1 cc. of reagent A, 0.1 cc. of platelet extract, 0.1 cc. of the plasma to be tested, and 0.1 cc. of a calcium solution (1.11 gm. of $CaCl_2$ per 400 cc.); (2) 0.1 cc. of reagent A, 0.1 cc. of platelet extract, 0.1 cc. of control plasma, and 0.1 cc. of calcium solution; (3) 0.1 cc. of reagent A, 0.1 cc. of platelet extract, 0.1 cc. of isotonic sodium chloride solution or a buffer, and 0.1 cc. of calcium solution; and (4) 0.1 cc. of A reagent, 0.2 cc. of isotonic sodium chloride solution, and 0.1 cc. of calcium solution. The coagulation times in the four tubes are compared. If the clotting defect evident in the hemophilic plasma is not corrected by the plasma being tested as it is by the control plasma, then the test plasma is deficient in factor A. Twelve of 18 hemophilic patients tested by the authors had less than 8% of the antihemophilic factor A. The new factor, B, was detected in a boy of 16 who had all the symptoms of familial hemophilia but whose blood was not deficient in factor A. Tests proved that the factor responsible existed in normal plasma and plasma treated with bishydroxycoumarin and also in normal serum. It resisted heating for 5 minutes at 56 C, but was destroyed at 64 C (partially in 5 minutes, completely in 20). It passed through Seitz filters of 20% asbestos but was retained by those of 50%, and was adsorbed by barium sulfate. Plasma from a patient with A-deficient hemophilia and that from one with B-deficient hemophilia were reciprocally corrective. A test for antihemophilic factor B, similar to that for factor A, uses 0.1 cc. of B-deficient hemophilic plasma, 0.1 cc. of platelet extract heated for 30 minutes at 64 C (this removes factors A and B), 0.1 cc. of the plasma to be tested, diluted 1/20, preferably in a buffer, and 0.1 cc. of $CaCl_2$ M/40. In these conditions, a patient with A-deficient hemophilia will have a clotting time equal to that of a control, while one with B-deficient hemophilia will have a prolonged clotting time.

Schweizerische medizinische Wochenschrift, Basel

83:325-348 (April 4) 1953. **Partial Index**

Paper Chromatography of Amino Acids Levels in Blood and Urine. C. Giddey.—p. 331.
Occasional Absence of Prolonged Bleeding from Small Wounds in Afibrinogenemic Patients. K. Lenggenhager.—p. 334.
*Hydralazine in Hypertension; Clinical Study. A. F. Essellier, W. Lüscher and L. Morandi.—p. 340.

Hydralazine in Hypertension.—Of 125 patients with hypertention, 76 were treated with hydralazine (Apresoline) and 49 were treated with 1,4-dihydrazinophthalazine (Nepresol). Of the first group of 76 patients, 11 were given intravenously single doses of 15 to 200 mg. of the drug diluted in isotonic sodium chloride solution, 11 were given intramuscularly single doses of 15 to 30 mg. of the undiluted drug, 17 with essential hypertension and 14 with nephrogenic hypertension received orally single doses of 200 to 350 mg., and 17 patients with essential hypertension and 6 with nephrogenic hypertension were given orally 75 to 900 mg. in three to four divided doses daily for 6 to 53 days. A definite drop of blood pressure resulted from the parenteral administration of hydralazine in 90% of the patients with nephrogenic and with essential hypertension. Oral administration of single doses of the drug was effective only in 70% of the patients, and those with nephrogenic hypertension seemed to respond less satisfactorily. The effective single parenteral dose varies from 20 to 40 mg. as compared to 25 to 100 mg. for the oral dose. The degree of the hypotensive effect of the drug cannot be increased by increasing the dose. On parenteral administration, the drug exerts its effect within several minutes, while the latent period after oral administration is much longer and varies considerably with the individual patient. The duration of the effect varies between 30 minutes and 10 hours independently of the route of administration. A much higher dose is required orally than parenterally to obtain the same duration of effect. Untoward side-effects, such as headache, nausea, and vomiting, particularly with parenteral administration, occurred in two-thirds of the patients. Since the hypotensive effect of the drug does not last longer than six hours, oral administration is the only method for continued treatment, but frequent and unpleasant untoward reactions make continued treatment with hydralazine difficult. Of the 49 patients treated with 1,4 hydrazinophthalazine, 25 were given single doses of 25 to 100 mg. in tablet form, and 24 received 25 to 750 mg. in two to four divided doses daily for 4 to 82 days. A definite hypotensive effect was obtained with single oral doses in three-fourths of the patients with essential hypertension and in one-half of the patients with nephrogenic hypertension. The threshold dose lies between 25 and 50 mg. The hypotensive effect occurred rapidly, mostly within 15 minutes, and it lasted for from 1½ to 10 hours and occasionally more than 24 hours. The depressive effect could not be regularly increased by increases of the dose, but its duration was somewhat prolonged. In some patients the effect of the drug varied with the same dose, and it was not always possible to prevent a new increase of blood pressure by repeated doses of the drug. A drop of 20 to 45 mm. Hg of the diastolic pressure was obtained with continued administration of 25 to 750 mg. of the drug daily in half of the patients with essential hypertension, while there was less response to the drug among the patients with nephrogenic hypertension. Untoward reactions to 1,4 dihydrazinophthalazine were less frequent and less unpleasant than those to hydralazine; occasionally they subsided despite continued treatment or after temporary reduction of the dose of the drug. Treatment had to be discontinued because of intolerance in one-eighth of the patients. The authors conclude that continued treatment of hypertensive patients with hydralazine or 1,4 dihydrazinophthalazine results in a drop of blood pressure in about half of the cases, but it does not restore the pressure to normal. Patients with essential hypertension respond better than those with nephrogenic hypertension. Side-effects are frequent and unpleasant but always reversible. The 1,4 dihydrazinophthalazine is somewhat superior to hydralazine in its effect. These interesting but not always therapeutically effective agents are still in the stage of clinical trial.

Semaine des Hôpitaux de Paris

29:1093-1126 (April 6) 1953. **Partial Index**

Intraspinal Cholesteatoma (Dermoid Cyst) Compressing the Cauda Equina; Report of Case and Nosological Discussion. D. Mahoudeau and S. Daum.—p. 1093.
Total Hypophysectomy in Treatment of Cancer. J. Le Beau and M. Perrault.—p. 1096.
*Hemispherectomy and Epilepsy: Electroencephalographic Studies. M. Feld and R. Lecasble.—p. 1104.

Hemispherectomy and Epilepsy.—Hemispherectomies were performed on two boys and two girls between the ages of 3½ and 15 years with jacksonian epilepsy. In all four cases pneumoencephalographic studies had revealed atrophy of one cerebral hemisphere, with total dilatation of the corresponding lateral ventricle. In each patient electroencephalographic recordings were made before, during, and after the surgical intervention. As a result of their observations the authors state that bilateral abnormal electrical activity manifested before the hemispherectomy is not a contraindication to the surgical intervention, provided that both the clinical and the roentgenologic findings indicate the surgical intervention. The abnormal electroencephalographic activity observed in two of the authors' patients in the nonatrophic hemisphere before the operation, proved after the operation to have been projected from the atrophic hemisphere; this activity, therefore, must be considered only as repercussion despite the fact that in one of the patients the chronological and morphological characteristics of this activity seemed to be autonomous. While preoperative electroencephalographic recordings did not reveal gross anomalies in one of the patients, the electrocorticogram (with the electrodes placed directly on the cortex) revealed a focus in the left frontal region with spikes and delta rhythm. Significant divergences between the preoperative electroencephalogram and the electrocorticogram may, therefore, be expected. Electroencephalographic recordings taken from the hemispheric stump after the removal of the pallium revealed a residual epileptic activity, localized in one patient in the insula, in another patient in the tail of the caudate nucleus,

and in a third both in the insula and in the caudate nucleus. In such cases surgical intervention should be completed by removal of the structure with abnormal electrical activity. Results obtained by adhering to this rule showed that the patients did not have additional functional deficiency. Postoperative electroencephalographic recordings revealed a small amplitude of the tracings obtained from the half of the scalp corresponding to the side operated on. The tracing obtained from the remaining hemisphere resumed its normal character; the previously recorded epileptic activity had disappeared. The small amplitude of the tracings on the operated side as projected by the opposite hemisphere becomes larger at a later period.

South African Medical Journal, Cape Town

27:257-272 (March 28) 1953. **Partial Index**

Supracondylar Fractures of Humerus in Children. C. Morris.—p. 260.
Rapid Diagnosis by Frozen Sections. F. A. Brandt.—p. 263.
*Internal Anal Sphincter: Its Surgical Importance. S. Eisenhammer. —p. 266.

Surgical Importance of the Internal Anal Sphincter.—According to Eisenhammer, the internal sphincter plays a leading role in the normal functioning of the anal canal. It is a continuation of the circular muscle coat of the rectum and is composed of unstriated smooth muscle that shows continuous involuntary postural tone. Like the involuntary smooth circular muscle of the alimentary tract, the internal anal sphincter is predisposed to spasm. It has been widely accepted that the division of the internal sphincter will give rise to anal incontinence. The author, however, emphasizes that, if a normal internal sphincter is divided, no postoperative spasm can occur and, when healing is completed, the anatomical variation is infinitesimal. If a contractured fibrotic muscle is divided, the initial separation is far greater and, on healing, normal expansibility and dilatation is restored. The slender subcutaneous external sphincter must be carefully preserved, as it guards against a patulous or gaping anus. The author describes and illustrates with diagrams the technique of internal anal sphincterotomy. He regards the following as indications for this operation: senile anal contraction or spasmodic stricture, postoperative stenosis, congenital stenosis, chronic anal fissure, hemorrhoids with or without a chronic fissure where contracture of the sphincter is present, uncomplicated hemorrhoids, anorectal abscess, low-lying intrarectal tumors, and constipation due to contraction of the internal sphincter. He calls attention to misunderstandings about the pecten band, which he defines as the lower free border of the internal sphincter that has undergone the changes described as chronic internal anal contracture. He stresses that an understanding of the surgical significance of the internal sphincter must lead to a better anatomical approach to the surgery of the anal canal.

Thorax, London

8:1-86 (March) 1953

Study of the Origin and Development of Lung Cancer. C. Raeburn and H. Spencer.—p. 1.
Carcinomatous Abscess of the Lung. C. Strang and J. A. Simpson.—p. 11.
Certain Unusual Radiological Appearances in Chest of Coal-Miners Suffering from Rheumatoid Arthritis. A. Caplan.—p. 29.
Physiological Basis of Reflux Oesophagitis in Sliding Hiatal Diaphragmatic Hernia. J. A. Aylwin.—p. 38.
Bronchial Arteries in Pulmonary Emphysema. L. Cudkowicz and J. B. Armstrong.—p. 46.
*Farmer's Lung: Review of Present Knowledge. C. J. Fuller.—p. 59.
Anomalous Pulmonary Venous Drainage. A. R. Muir.—p. 65.
Influence of Streptomycin on Incidence of Pleural Effusion Complicating the Division of Adhesions. D. C. Beatty and A. Wiener.—p. 69.
Practical Measure of the Maximum Ventilatory Capacity in Health and Disease. M. C. S. Kennedy.—p. 73.

Farmer's Lung.—Fuller says that the terms farmer's lung and thresher's lung are synonymous. He has observed 32 patients with this disorder during the past eight years. Farmer's lung occurs in three forms: (1) the acute isolated attack, (2) the subacute and more chronic condition, which usually terminates in spontaneous recovery, and (3) the chronic and irreversible phase, in which secondary lung changes such as emphysema and fibrosis have occurred as a result of repeated exposures over a period of years. Five of the 32 patients had short acute attacks, 24 were in the subacute phase, and three had chronic pulmonary damage. Farmer's lung seems to be due to the inhalation of dust from moldy hay or straw. It has been suggested that this disease might be a true bronchomycosis and that Candida albicans might be the causal fungus, but Fuller says the evidence is far from conclusive. If farmer's lung were due to a bacterial infection, it would seem reasonable to expect that microscopy and sputum cultures would reveal some recurrent and constant infecting organism, which has not been the case. A third possibility is that farmer's lung is a form of asthmatic response to sensitization either by the degradation products of moldy grass or to molds themselves. If by asthma one means bronchial edema and spasm, accompanied by forced expiratory effort and sibilant rhonchi, then farmer's lung is not asthma. The fourth possibility is that farmer's lung is the result of irritation of the bronchial epithelium by the breakdown of mold spores and possibly grass particles resulting in miliary inflammatory response. Repeated exposure to hay or threshing dust with a high mold spore content eventually might produce in the bronchial wall a lesion resembling fungal granuloma in rabbits. Histological material from human subjects is difficult to obtain, because farmer's lung is almost never fatal. The one death that occurred in this series was in a patient who two years previously had had an attack of farmer's lung with spontaneous recovery. Necropsy showed widespread pulmonary tuberculosis. Neither culture nor microscopy of the lung tissue showed evidence of bronchomycosis. Many questions about farmer's lung remain unanswered, and the author suggests further studies.

Wiener klinische Wochenschrift, Vienna

65:241-260 (March 27) 1953. **Partial Index**

*Vagotomy Combined with Simple Suture as Surgical Treatment for Perforated Gastric and Duodenal Ulcers. R. Jelinek.—p. 245.
Therapy of Hypertension. E. Hueber.—p. 248.
Processes of Myomalacia in Cardiac Auricles. P. Hermanek.—p. 248.
Relief of Pain in Incurable Carcinoma of Genitals. H. Tischer and J. Reitinger.—p. 252.

Vagotomy Combined with Simple Suture for Perforated Ulcers.—Between 1947 and 1952, 8 men with perforated ulcers of the stomach or duodenum were treated by simple suture followed by primary vagotomy and 16 were treated by suture or drainage and formation of an omental cuff followed by secondary vagotomy one and a half months to six years later when a new ulcer occurred. Length of postoperative hospitalization averaged 22 days in the first group and 19 days in the second group. Most of the patients were followed up for four to five years. Of the eight patients with primary vagotomy, six (four with gastric and two with duodenal ulcers) became completely free of complaints and their working capacity was fully restored. One of the remaining two with duodenal ulcers complained of vagus diarrhea and in the other carcinoma of the stomach developed but probably had no causal relationship with his former condition. One of the 16 patients with secondary vagotomy was lost to observation. Of the remaining 15, 9 were operated on for duodenal ulcer and 6 for gastric ulcer and 13 of them submitted to follow-up examination. Nine of the patients were free of complaints, and eight of these nine had been operated on for duodenal ulcer. Of the remaining four patients, gastritis was demonstrated on roentgenologic examination in two and a deformation of the duodenal bulb in one, while no pathological changes were observed in the last patient who complained of diarrhea. One of the 16 patients with secondary vagotomy died of pulmonary embolism on the third postoperative day. Because of the risk of malignant degeneration of ulcer of the stomach, the author is no longer using vagotomy for treatment of perforated gastric ulcer. As a result of his experience in this small group of patients, he feels justified in recommending vagotomy for further trial in certain cases of duodenal ulcer because of the simple technique, the small burden on the patient, and the low mortality. Diffuse peritonitis is the only contraindication to the method.

BOOK REVIEWS

Human Factors in Air Transportation: Occupational Health and Safety. By Ross A. McFarland, Ph.D., Associate Professor of Industrial Hygiene, Harvard School of Public Health, Cambridge, Mass. Cloth. $13. Pp. 830, with illustrations. McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 18; 95 Farringdon St., London, E.C.4, 1953.

This timely and significant book makes available to the medical profession an authoritative analysis of an important subject. A wide range of information from the biological and engineering sciences has been integrated with the specific problems of aviation medicine and flight safety. The treatment is broad in scope, and the data are applicable to both civilian and military flying and to industry in general.

Beginning with the selection of men for flight training, a wealth of source material of interest to the general practitioner has been reviewed and interpreted. The various tests in the most exacting of all physical examinations are related to the requirements of the job. Such a functional interpretation of a physician's findings may aid in the placement of personnel and in prolonging the useful lives of workers in many other occupations. Dr. McFarland points out that all the problems of flying cannot be answered by the aeronautical engineer. Indeed, the limiting factors in flying are in the capacity of the human organism to adapt to tremendous variations in altitude, acceleration, and prolonged periods of intense concentration. The great value of periodic health examinations is clearly illustrated by many case studies. Chapters on the maintenance of physical and psychological fitness, operational fatigue, and aging should aid the physician in handling many problem cases.

Other chapters of particular interest to physicians deal with the sanitary control of airports and ground facilities and health and quarantine regulations in air travel. An analysis of the problem of transportation of disease or disease vectors by aircraft is included. Since passengers can be conveyed from an infected to an uninfected area during the incubation period of the major communicable diseases, every physician should be aware of these dangers of air travel.

With the tremendous increase in air transportation, the physician is confronted with problems relating to the advisability of air transport for patients with various disabilities. Dr. McFarland has made many suggestions regarding the care and welfare of patients traveling by air. This thorough analysis of the physical and physiological problems encountered in flight, illustrated with case material, should aid the physician in making decisions regarding individual patients.

The chapter on the effective development of medical and safety departments in air transportation provides an excellent model for many other industries. It would be difficult to find a more convincing case for the great values to be derived from applying modern medical procedures to industry.

While this book can be read profitably by aviation medical specialists, the author's comprehensive approach to the subject of occupational health and safety recommends it as an important reference source for the physician. Excellent illustrations and summarizing paragraphs at the conclusion of each chapter enhance the usefulness of the book.

Fundamentals of Clinical Cancer with Emphasis on Early Diagnosis and Treatment. By Leonard B. Goldman, M.D., Clinical Professor of Radiotherapy, New York Medical College, Flower and Fifth Avenue Hospitals, New York. Cloth. $8.75. Pp. 312, with 222 illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1953.

This book is merely a collection of material that has been published repeatedly; there is nothing new or original in the presentation or approach. The author states in the preface that some may take exception to the absolute statements and conclusions he presents but that his conclusions are the results of his own experience in treating cancer patients during the past 20 years. It is, nevertheless, dangerous to state as fact subjects that are controversial. For example, Paget's disease of the breast is dismissed in a mere four lines; it is specifically referred to as "an outward extension of a deeply seated cancer of the breast." Many would take issue with this statement. With regard to aspiration punch biopsy the author states that the capsule is not broken and no infection is introduced. In the next sentence, however, he states that a minute nick in the skin is made over the tumor. This not only breaks the capsule but may introduce infection; furthermore, the possibility of missing a small malignant zone by use of this method is not mentioned. The statement that early cancers may be removed by simple surgery while invasive cancers should be eradicated by radical surgery might be challenged. Some authorities on cancer surgery would take a diametrically opposite view.

Since this work deals with fundamentals of diagnosis, some mention should have been made of the differentiation of cardiospasm from cancer of the esophagus. Although figure 106 on page 122 shows the relaxation of the spasm after administration of amyl nitrite, the roentgenograms are so poorly reproduced that no differentiation can be made.

Figure 110 on page 127 is a poor example of art work; figure C of this illustration appears to be the ulcerating rather than the infiltrating lesion. On page 149 the statement is made that the gallbladder is palpable in cancer of the extrahepatic ducts "because the common bile duct is obstructed." This is a poor explanation, since the common bile duct is also obstructed when a stone is present, yet the gallbladder is small. No attempt is made to differentiate these two conditions or to explain the pathophysiology that results in the small inflamed gallbladder as compared to the noncicatrized organ, which is distendable.

Chapter 7 dealing with tumors of the breast is poorly presented. Both skin retraction and nipple retraction are stated to be caused by "fibroblastic reaction." This is evasive and confusing, particularly since no mention is made of the importance of the involvement of Cooper's ligaments and the lactiferous ducts as pertaining to these phenomena. Figure 155 demonstrates gentle palpation of a nodule in the breast for the purpose of demonstrating dimpling. Since tactile sensation and gentleness are important, one wonders why the examiner's hand is gloved. The subject of mammary dysplasia is presented under the old terminology of cystic hyperplasia (chronic cystic mastitis). It is impossible to dismiss such a subject in less than 10 lines. Greater attention to detail and arrangement of material might have improved this work.

The Management of Abdominal Operations. Edited by Rodney Maingot, F.R.C.S. Cloth. $24. Pp. 1253, with 532 illustrations. The Macmillan Company, 60 Fifth Ave., New York 11, 1953.

This volume is directed to "postgraduates . . . senior resident medical and surgical officers. . . . Fellowship candidates . . . the general surgeon and those who are desirous of keeping abreast with developments in this field." The editor is one of Britain's outstanding surgeons, well-known in America for his previous books and writings, and his collaborators are 32 other British authorities. The manner of presentation is most successfully carried out in that this work of 33 different writers is coherent and uniform throughout in its point of view. The book is a summation of everything that concerns abdominal operations and reads like an informal, concise discussion by an authority. The authors assume that the reader is conversant with classical symptomatology and minutiae of operative technique; thus he does not have to reread standard material to obtain a new or important point. This forthright presentation permits a mature discussion, for which the authors and editor deserve great praise.

Another outstanding feature is the inclusion of the latest advances associated with major abdominal surgery. There are excellent chapters on fluid and electrolyte balance, surgical

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

shock, chemotherapeutic and antibiotic drugs in abdominal surgery, the role of vitamins in abdominal surgery, abdominal injuries, and abdominal operations in children. Discussions of the internist's point of view are included when pertinent. The chapter on clinical and pathological values in health and disease is of practical value to the busy surgeon who has not been close to the laboratory where rapid advances are taking place. In keeping with progress is a chapter on psychological factors in abdominal surgery; this is not a perfunctory discussion in generalities but an excellent presentation in concrete terms.

No large work can possibly include every detail, and this one contains certain omissions and disagreements. In the chapter on biliary tract disease, no mention is made of Phemister's classical work on the etiology of calcareous deposits or calcified gallstones (cystic duct obstruction), although beautiful illustrations of calcified gallstones are shown. Too little is said of the patient who is just as ill after cholecystectomy as he was before. All surgeons would not agree that "the Talma-Morrison operation now has no place in the treatment of ascites, etc."; no mention is made of preoperative "chronic shock," i. e., reduced blood volume; venous pressure receives scant mention in connection with shock, and the only blood substitute mentioned is acacia (gum arabic). In the chapter on psychological factors are the statements: "If a patient asks and is told he has the disease [cancer] . . . Nothing is to be gained by deliberately lying to the patient." Many persons of experience believe that in no circumstances should a patient be told he has cancer. The family, or close friends if there is no family, of course, must be told the complete truth.

The appearance of the book is most attractive. The paper is of excellent quality, the large print agreeable to the eye, the tables and figures informative, and the illustrations are of the highest quality. This work is recommended as a reference and textbook for those doing abdominal surgery. The book will serve to crystallize thinking in this field and present new facts and stimulating ideas. It is a comprehensive postgraduate course in abdominal surgery that will not become outdated for some time.

Comroe's Arthritis and Allied Conditions. Editor: Joseph Lee Hollander, M.D. Collaborating editors: Nathan R. Abrams, M.D., et al. Fifth edition. Cloth. $16. Pp. 1103, with 399 illustrations. Lea & Febiger, 600 S. Washington Sq., Philadelphia 6, 1953.

Owing to the rapid advances made in the field of rheumatology in recent years, there has been a real need for revision of this book. This has been eminently accomplished in the present edition. The editor and the 17 collaborators are experienced rheumatologists, some of whom have been outstanding in clinical and investigative work. In addition to the basic information that this textbook has always contained, the more recently developed concepts in the field of rheumatology are included. For the most part the original format has been retained, including the helpful summaries in box form. Numerous excellent illustrations have been added. The bibliographies at the close of each chapter are extensive and in most instances include recent references. The style is uniform and easy to follow.

The book has 10 parts, about half of which are devoted to etiology, pathology, and treatment of rheumatoid arthritis. The remainder of the book concerns rheumatoid spondylitis, degenerative joint disease, collagen diseases, gout and other forms of metabolic arthritis, arthritis due to specific infections, traumatic arthritis, painful back, and arthritis associated with uncommon diseases. Proper emphasis is placed on the commoner types of arthritis, with brief discussions on the less common musculoskeletal diseases.

The new chapter on etiology of rheumatoid arthritis contributes a great deal of new thought in this field. The chapters on corticotropin, cortisone, and the intra-articular injection of hydrocortisone reflect the present concept and use of these hormones. There is none of the early hope for a miraculous cure or fear of permanent harmful effects from administration of these steroids; instead, there is a realistic appraisal of the benefits and limitations of the hormones in the treatment of rheumatoid arthritis and other rheumatic conditions. The chapter of low back pain and sciatica is a valuable addition covering anatomy, salient points in the history and physical examination of low back strain, and herniation of the intervertebral disk. Summaries in box form would have added to the value of the chapter, and its contents could have been developed more fully. This book remains the best authoritative volume on arthritis and allied diseases. It is highly recommended to students of rheumatology, internists, general practitioners, and undergraduate students.

Poliomyelitis. By W. Ritchie Russell, C.B.E., M.D., M.A., Consultant Neurologist to United Oxford Hospitals, Oxford, England. Cloth. $3. Pp. 84, with 20 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2; Edward Arnold & Co., 41-43 Maddox St., London, W.1, 1952.

This small volume can be read in a single evening, and it should be a rewarding and interesting experience for any physician who wants a quick "refresher course" on the aftercare of poliomyelitis. The author, unlike most neurologists interested in poliomyelitis, is concerned with clinical aspects of this disease beyond the central nervous system. The book reflects the fact that Dr. Russell has a wide and general clinical experience with poliomyelitis and has followed patients not only in the role of a neurological consultant but as a physician in charge of the case; that is, from the time his patients have come into the hospital, through the anxious period of acute illness, through the infectious stage, and throughout subsequent months or years in cases with paralysis. In this respect he has demonstrated how a neurologist often can give continuity to the therapeutic team and can occupy a position as an intermediary with the internist, the orthopedist, and the physical therapist.

The first half of the book concerns the nature of poliomyelitis, its clinical features, physical examination, and some of the etiological factors. The second half describes management and treatment and reflects the author's experience in handling serious cases of poliomyelitis.

Two points that have not received enough emphasis in the U. S. deserve mention. One is the theory that postural drainage is a simple measure often neglected in the care of patients with respiratory paralysis and/or bulbar involvement. The author is convinced that the use of proper posture for the patient is vitally important and should not be delayed. The other point is his belief that the treatment of paralyzed limbs need not be dominated by the rule that weak muscles should always be rested in a partially relaxed position. He does not believe that deliberately induced fatigue harms paretic muscles in the recovery stages of poliomyelitis. If one is willing to accept this point of view, the value of various methods of handling paralyzed muscles can be subjected to simple physiological tests to compare the results of grossly different plans of treatment.

Diagnostic Tests in Neurology: A Selection for Office Use. By Robert Wartenberg, M.D. Forewords by Sir Gordon Holmes, M.D., F.R.S., and by Stanley Truman, M.D. Cloth. $4.50. Pp. 228, with 62 illustrations. Year Book Publishers, Inc., 200 E. Illinois St., Chicago 11, 1953.

Dr. Wartenberg has justly deplored the overemphasis on neurological diagnosis by laboratory methods, many of them inappropriate and, at times, misleading. His view is well expressed by quotation from Balfour: "I very much doubt if the modern doctor with the laboratory at his back . . . is as good at the bedside . . . as those who have had to trust to their powers of observation." Nowhere is that truer than in the field of neurology. Yet a losing battle is being fought; there is an ever increasing tendency to join Foster Kennedy's "Union of Slick Gadgeteers."

In this short monograph the author has discussed a number of simple clinical tests that are of value in demonstrating disorders of the nervous system. Whether such a disconnected presentation of a group of signs and tests is of value each reader must determine for himself. Neurology, however, is not "reflexology," and this book, as the author has stated, is a systematic presentation of neurology correlated with basic anatomy, physiology, and pathology.

Some of the author's premises are questionable. His discussion of the unilateral dilatation of the pupil, which develops

after head injuries (page 37), is incorrect. Dilatation seldom is due to pressure of a blood clot on the third nerve. In fact, with an extradural hemorrhage arising from the middle meningeal artery, that could not occur. Usually the uncus herniating through the incisura of the tentorium cerebelli involves the third nerve. Furthermore, such a mydriasis, with or without a hemiparesis, may develop as the result of a subdural hemorrhage as well as with bleeding from the middle meningeal artery. Most neurologists would not agree that a slow, coarse nystagmus on looking to one side is primarily indicative of a cerebellopontine angle tumor (page 43); in fact, an intracerebellar tumor is more likely. Although the author has recognized that many so-called pyramidal signs are associated with lesions of the extrapyramidal system, he seems to have promoted this confusion rather than clarified it (section 3). There are a limited number of references in the text, but there is no bibliography.

Pathologie und Bakteriologie der Endokarditis. Von R. Böhmig und P. Klein. Cloth. 66 marks. Pp. 312, with 104 illustrations. Springer-Verlag, Reichpietschufer 20, (1) Berlin W. 35 (West-Berlin); Neuenheimer Landstrasse 24, Heidelberg; Göttingen, 1953.

This book represents the combined efforts of a pathologist and a bacteriologist and is based on the examination of 300 cases of endocarditis observed at necropsy. There are, consequently, few clinical considerations. After presentation of the general pathology of endocarditis and normal anatomic changes, bacteriology is discussed, including questions of technique and emphasis on the classification of streptococci. This is followed by a chapter on the particular pathological anatomy and bacteriology of endocarditis. The classification differs from that accepted in the U. S., and emphasis is given to serous endocarditis as a manifestation of inflammatory edema. Principles of antimicrobial therapy are also discussed in this chapter. A short chapter deals with transition of the different types of endocarditis and the attempt to present an organized scheme. Another chapter concerns experimental endocarditis and the observations of the investigators. The final chapter, mainly speculative, presents the results and conclusions applicable to clinical medicine. The presentation attempts to integrate the recent American concepts of endocarditis and collagen diseases with the older German studies, and the American literature is well represented. A considerable amount of factual information is intermixed with remote philosophical concepts, which, as such, seem to add little to the understanding of pathological processes. This difficulty is aggravated by an awkward style and lengthy, sometimes incomprehensible, sentences. The illustrations are excellent. The book has limited value for the American clinician or pathologist and may serve best to illustrate the German position on the pathology of endocarditis.

Blood Cells and Plasma Proteins: Their State in Nature. Edited by James L. Tullis. Memoirs of University Laboratory of Physical Chemistry Related to Medicine and Public Health, Harvard University, number 2. Cloth. $8.50. Pp. 436, with illustrations. Academic Press, Inc., 125 E. 23rd St., New York 10, 1953.

This book records a series of seminars on the physical chemical characteristics and biological properties of blood and plasma. The book is divided into seven sections covering the formed and fluid parts of human blood; their discovery, characterization, and classification according to physical properties and chemical interactions; factors concerned with blood coagulation; components of human blood concerned with immunity; erythrocytes; leukocytes; enzymes of the plasma; and lipoproteins and glycoproteins of blood and tissues. The subjects are discussed by a number of authorities, and many charts, tables, and diagrams illuminate the text.

The material in this volume is highly important in view of the increasing use of various fractions of human blood in the practice of medicine. The inclusion of historical background in some of the sections, particularly in that presented by E. J. Cohn, is commendable. Part of the material is highly technical and is meaningful primarily to those who have a special interest in the chemical aspects of the subject. On the other hand, a large portion of the book is of general medical and biological scope and importance and is understandable without special knowledge of physical chemistry. For example, the sections on the blood clotting system, the immune globulins, and the lipoproteins present many of the current theories. This book is recommended to anyone interested in keeping abreast of modern developments in medicine and its allied fields.

Famine Disease in German Concentration Camps: Complications and Sequels, with Special Reference to Tuberculosis, Mental Disorders and Social Consequences. By Per Helweg-Larsen, et al. Supplementum 83, Acta psychiatrica et neurologica scandinavica. Paper. Pp. 460, with 25 illustrations. Ejnar Munksgaards Forlag, Nørregade 6, Copenhagen, K, 1952.

This monograph is a valuable clinical description of famine disease as the syndrome was reported by 1,282 Danes who survived internment in German concentration camps during World War II. It pictures the macabre conditions under which starvation occurred and recognizes the difficulty of separating the effects of psychic trauma from nutritional factors that contributed to the syndrome of famine disease. Of special merit are the sections dealing with hunger edema, polyuria, hunger diarrhea, alimentary diarrhea, metabolism, avitaminoses, and mental deterioration. The record of treatment, emphasizing a dietetic regimen, will aid physicians in avoiding some of the errors that occurred during World War II as a result of a too sophisticated approach of clinicians to the supposed deficiency states in semistarved patients. The description of rehabilitation and the comments on the permanence of the famine-induced condition will be of interest to those concerned with rehabilitation of such persons. The 484 complete references in the bibliography enhance the value of the book. Study of this document is recommended to medical nutritionists, psychiatrists, internists, and others concerned with the care and rehabilitation of war prisoners.

Advances in Internal Medicine. Volume V. Editors: Williams Dock, M.D., and I. Snapper, M.D. Cloth. $10.50. Pp. 464, with illustrations. Year Book Publishers, Inc., 200 E. Illinois St., Chicago 11; Interscience Publishers, Inc., 2a Southampton Row, London, W.C.1, 1952.

This is a collection of nine authoritative review articles on topics of current interest in internal medicine. The reviewers summarize and interpret the results of recent investigations and discuss application of these results to clinical management. Extensive bibliographies are appended. The volume begins with a practical discussion of the diseases of the pregnant woman affecting the fetus. This is followed by a scholarly review of the technique and complications of cardiac catheterization and the information on circulatory dynamics gained by this procedure in various types of heart disease. There is a short discussion of the mechanism of production of portal hypertension and the various surgical approaches to its correction. The metabolic and pathological changes occurring in the anemia of infection and in gout are reviewed in detail, and the management of these conditions is outlined. Other chapters consider the clinical use of ganglionic and adrenergic blocking agents, clinical experiences with corticotropin and cortisone, and various aspects of the influenza problem. A final chapter deals with laboratory investigations of abnormal proteins in myeloma. The reviews are adequately indexed. Physicians interested in the subjects covered will find this volume a useful postgraduate refresher course and reference work.

Pain Syndromes and Their Treatment with Special Reference to Shoulder-Arm Pain. By James M. Tarsy, M.D., Chief, Arthritis Clinic, University (New York Postgraduate) Hospital, New York University-Bellevue Medical Center, New York. Cloth. $12. Pp. 592, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 299 Queen St., W., Toronto, 2B, 1953.

This excellent book should be welcomed by all physicians, because pain probably represents about 50% of patients' complaints. In this book, these problems are outlined mostly with respect to pain in the body; problems of pain in the head are not included. Considerable space is devoted to diagnostic and therapeutic blocks for pain. One of the outstanding sections of the book is an exhaustive consideration of diagnosis and treatment of shoulder-arm pain and other similar types of pain. The paper is of fine quality; the illustrations are excellent; and the index is adequate.

Cardano the Gambling Scholar. By Oystein Ore. With translation from Latin of Cardano's Book on Games of Chance, by Sydney Henry Gould. Cloth. $4. Pp. 249, with 33 illustrations. Princeton University Press, Princeton, N. J., 1953.

Girolamo Cardano of Milan was one of the fathers of medicine "next to Paracelsus and Nostradamus." He was born in 1501 and died in 1576, leaving behind 10 huge volumes containing information on many subjects. The son of a gifted father, Cardano was born out of wedlock, which barred him from membership in some of the learned societies. He was poor, but "When he finally began to make money he managed his affairs well, and above all he was a very popular physician with a great and universally recognized reputation" (page 34). Cardano was a student of all the sciences and philosophies and was a prolific writer on mathematics, astronomy, physics, ethics, religion, and philosophy. He also published a life of Christ and one of the Blessed Virgin. He was an egoist but confessed equally to vices and virtues and was "an enigmatic character" who, in the words of Bacon, "seems to have taken the whole world for his province." In some respects Cardano resembled Voltaire in his brilliance, his inconsistencies, and his utter unreliability; yet he had a certain sweetness and light that charmed many men but brought hate from others.

Professor Ore became interested in Cardano partly because of his attempt to rationalize gambling, to put "chance" on a sound basis with formulas and discussion of those "probabilities" that some of us first encountered in advanced algebra. The last section of the book is a translation of Cardano's "Liber de Ludo Aleae" or "Book on Games of Chance." This book is interesting and is exceedingly well put together.

Oral Anatomy. By Harry Sicher, M.D., D.Sc., Professor of Anatomy and Histology, Loyola University School of Dentistry, Chicago College of Dental Surgery, Chicago. Second edition. Cloth. $13.50. Pp. 529, with 310 illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1952.

This is a concise, well-written, and accurate monograph on anatomy of the head and neck. The illustrations are good, and the type and format make for easy reading. The first section deals with basic anatomy and the second with its practical application. This section should be of interest to students and physicians alike. There are excellent discussions of the applied anatomy of local anesthesia blocks, arterial hemorrhages and their control by ligation, the spread of dental infections along anatomic planes, tracheotomy and laryngectomy, the temporomandibular joint, and the endentulous mouth. While this book was designed primarily for dentists, it should also be valuable to students and surgeons interested in head and neck surgery. A copy in every hospital medical library would be a practical aid to the intern and resident staff.

Ménière's Disease. By Henry L. Williams, M.D., M.S., Head of Section of Otolaryngology and Rhinology, Mayo Clinic, Rochester, Minnesota. Publication number 129, American Lecture Series, monograph in Bannerstone Division of American Lectures in Otolaryngology, Audiology and Broncho-Esophagology. Edited by Norton Canfield, M.D., Associate Clinical Professor of Otolaryngology, Yale University School of Medicine, New Haven, Conn. Cloth. $7. Pp. 349, with 8 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 49 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, 1952.

For many years the diagnosis and treatment of Ménière's disease have been difficult. Since Ménière's original description of the disease nearly a century ago, many conflicting opinions have been expressed regarding every phase of the entity. Most physicians are at a loss as to what procedure to follow when confronted by patients with vertigo, dizziness, tinnitus, incoordination, deafness, nausea, and vomiting. In an attempt to introduce order into this situation, the author has drawn on his extensive experience to describe in rational fashion such topics as anatomy and physiology of the labyrinth, histopathology and physiopathology, loss of hearing, diagnosis and differential diagnosis, allergy and autonomic dysfunction, and medical and surgical treatment. This book is an important contribution to medical literature and is highly recommended.

Oral Surgery. Volumes I and II. By Kurt H. Thoma, D.M.D., F.D.S. R.C.S. Second edition. Cloth. $30. Pp. 865; 867-1688, with 1789 illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1952.

A wealth of new material has been presented in this edition. The author has incorporated chapters on local and general anesthesia and one on chemotherapy. Detailed consideration is given to abnormalities of the edentulous mouth and the combined oral and surgical prosthodontic problems. The chapter on surgical correction of developmental deformities involving the face and jaws includes new procedures. Two other chapters discuss acquired jaw defects and surgical deformities that require correction by means of grafts and the treatment of oral abnormalities and defects.

The chapter dealing with the general care of the patient is exceedingly well done. In the preface to the first edition, the author mentions that some might believe that the subject of supportive care has been overemphasized; however, Dr. Thoma believes that such overemphasis is rarely possible. The fact that controversial theoretical minutiae have been omitted is especially commendable. The chapter on treatment of traumatic disease of the jaws is outstanding because of the detailed yet terse manner in which the material is presented. As in the other chapters, the text reads well and can be easily assimilated.

The use of red coloring to depict submucous layers and cleavage planes aids the attempt to produce tridimensional perspective. It is unfortunate that the color did not reproduce well on some of the pages. In the chapter on anesthesiology the danger of infiltrating inflamed tissues is emphasized. Although this is an established fact, reemphasis is warranted. A minor fault is the method of labeling figure 1028. The names of the structures rather than letters should have been placed on the illustration. This work can be unreservedly recommended to anyone interested in oral surgery.

Clinical Obstetrics. By members of staff of Pennsylvania Hospital. Edited by Clifford B. Lull, M.D., and Robert A. Kimbrough, M.D., Director of Division of Obstetrics and Gynecology, Pennsylvania Hospital, Philadelphia. Cloth. $10. Pp. 732, with 400 illustrations. J. B. Lippincott Company, 227-231 S. Sixth St., Philadelphia 5; Aldine House, 10-13 Bedford St., London, W.C.2; 2083 Guy St., Montreal, 1953.

This book has been prepared by a number of specialists discussing the phases of their fields that are related to clinical obstetrics.

The management of the newborn in the neonatal period is well covered, and the discussion on the relation of roentgenology to the practice of obstetrics is well done and profusely illustrated. Anesthesia, both local and general, is described with possibly too much emphasis on spinal anesthesia for the teaching of undergraduate students. There are sections on sterility and fertility in both men and women and the influence of diet on pregnancy and the puerperium.

The book is well illustrated, and the type is clear and well spaced. It should be an excellent book for undergraduates beginning the study of obstetrics, postgraduates at the intern and residency level, and general practitioners who have obstetric problems.

Gastric Cancer. By Alfred H. Iason, M.D., Attending Surgeon, Adelphi Hospital, Brooklyn, N. Y. Cloth. $7.50. Pp. 316, with 100 illustrations by Alfred Feinberg, Instructor of Medical Illustration, Department of Pathology, College of Physicians and Surgeons, Columbia University, New York City. Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1953.

This monograph on gastric cancer represents a tremendous amount of work and is a good résumé of the current thinking on this subject. It is unfortunate that a book containing so much information does not give any of the author's experience and does not include more original illustrations. In fact, the work represents a compilation of the literature and contains an extensive bibliography, although an evaluation of the various concepts is not particularly well done. The book may be of value to the student because of the extensive bibliography, but it is not otherwise recommended.

QUERIES AND MINOR NOTES

VACCINATION OF CHILD WITH ECZEMA

TO THE EDITOR:—*A girl, 5 years of age, has had atopic eczema since the first year of life, the antecubital and popliteal areas being chiefly affected. Various substances have been used locally, with little benefit. The child has never been vaccinated against smallpox. It is my understanding that smallpox vaccination is contraindicated in the presence of eczema. Is there any method by which smallpox vaccination, which is required for admission to public school, can be done safely in this case?*

M.D., Washington, D. C.

ANSWER.—It is not necessary to withhold smallpox vaccination from a child with localized atopic eczema. It is, however, desirable to vaccinate such a child at a time when the eczema is quiescent rather than during a flare-up. Also, reactions that are more apt to occur in a child with the atopic form than in one with a nonatopic form should be anticipated. A flare-up of the eczema may occur during the reaction to vaccination, with consequent increase of discomfort and necessity for resort to local treatment of the eczema. It is possible that a kaposiform eruption of the varicelloid or herpetic type will develop. Obviously, measures to prevent transfer of material from the site of vaccination to eczematous areas of the skin should be employed. In the young child who cannot be relied on to cooperate, protection by bandaging of affected areas may be necessary temporarily.

IODIDE AND BROMIDE ERUPTION

TO THE EDITOR:—*A pustular, acneform rash confined to the face, especially the nose, forehead, and chin, appeared in a 47-year-old man a few weeks after he began to use a bromine-containing hypnotic and an iodine-containing multivitamin and mineral preparation. The use of both these preparations was stopped when the eruption appeared, but several weeks have elapsed and the condition persists. What is the best treatment for this mild bromidism and iodism, topically and systemically? The patient's occupation makes it imperative that his appearance cosmetically be of the best. The only relevant past history is adolescent acne of the face of several years' duration, which cleared up following x-ray treatment. Would application of ultraviolet light help now?*

M.D., New York.

ANSWER.—This eruption appears to be one of the typical manifestations of sensitivity to iodine or bromine or both. The most important therapeutic measure is to interdict the intake of iodine and bromine insofar as this is possible. This means elimination of drugs containing iodides and bromides, iodized salt, and the following foods, which contain large amounts of iodides: clams, crabmeat, lobsters, oysters, salmon, shrimp, red snapper, flounder, cod fish, asparagus, radishes, tomatoes, carrots, lettuce, the leafy vegetables such as kale, mushrooms, watercress, potatoes, and eggs. The second step in treatment is ingestion of large amounts of regular table salt, provided there is no contraindication, such as severe hypertension. This promotes the excretion of both iodides and bromides. The local treatment of the eruption should be similar to that used for acne vulgaris. A flesh-tinted sulfur and resorcin ointment, such as Acnomel or Sulforcin base, is satisfactory, and, in addition, these preparations tend to obscure the lesions and make the condition less conspicuous. Also, it may be advisable to open the individual lesions with an acne stilette. There is no contraindication to the use of ultraviolet light therapy, but it is doubtful that this would change the course of the eruption significantly.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically so stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

FEVER IN THREE SIBLINGS

TO THE EDITOR:—*I am caring for four children who have resided in Kodiak, Alaska, within the past year. About nine months ago, all four were given BCG vaccine, because they had negative tuberculin test results. The three older children were told they had a successful vaccination, but the youngest had no reaction. At present, all except the youngest have daily temperatures ranging from 99.5 to 101 F. All appear relatively healthy and show no abnormal physical conditions. Roentgenograms of the chest were normal. Results of brucellosis tests, tuberculin patch tests, and intracutaneous old tuberculin tests are all negative. A trial course of antibiotic therapy produced no change in temperature. Could the BCG still be causing the fever?*

Russell E. Atkinson, M.D., Crestline, Calif.

ANSWER.—The fact that the results of tuberculin tests are negative now rules out the BCG vaccine as a cause. If tuberculosis is the cause of the fever, the infection is recent, since allergy has not yet developed. The fact that the three children are febrile at the same time points more strongly to an intercurrent infection. Primary tuberculosis manifests certain symptoms in children that are not produced by other conditions, notably a fleeting morbilliform rash of varying degrees of intensity. Instead of clearing there is a dry, scaly residue that may remain for some time. Occasionally erythematous lesions may be present. Otherwise, there are no systemic symptoms. If the process is tuberculous, the tuberculin test should become positive within three months from the time of infection. The children's condition seems to be some obscure process that does not fit into the pattern of ordinary children's diseases. Rheumatic fever is a possibility, and it has been noted to occur in families, but in this family the possibility seems remote. Brucellosis should be searched for again. Infectious mononucleosis could explain the phenomenon. Blood cell counts should confirm or disprove presence of such a condition.

CANCER OF CERVICAL STUMP

TO THE EDITOR:—*Please discuss the incidence of carcinoma of the cervix following conization as compared with total hysterectomy. When there is technical difficulty in removing the cervix, is a combination of subtotal hysterectomy plus conization advocated?*

John P. Gifford, M.D., Vero Beach, Fla.

ANSWER.—Most authorities agree that carcinoma of the cervical stump is not rare. In a study by Carter and co-workers (*Am. J. Obst. & Gynec.* **57**:37, 1949) on adenocarcinoma of the cervix, it was found that 22% of the cases occurred in women with cervical stumps. A report from the department of obstetrics and gynecology of Vercelli (Cantone, C.: abstracted, *Am. J. Obst. & Gynec.* **55**:543, 1948) stated that carcinoma of the cervical stump developed in 0.67% of the patients who had had previous supracervical hysterectomies. These and other reports plus the observations of this consultant confirm the belief that, if at all possible, total hysterectomy is the procedure of choice. It is realized that in some patients it is technically difficult, if not impossible, to remove the cervix, and in these a combination of subtotal hysterectomy and conization of the cervix is beneficial. Crossen (*Am. J. Obst. & Gynec.* **57**:187, 1949) used wide conization and believed that it combined well with abdominal surgery. He states that in patients in whom hysterectomy must be supravaginal instead of complete, conization is especially helpful in eliminating the menace of continuing cervicitis in the cervical stump. In his series, wide conization of the cervix definitely reduced the incidence of subsequent cervical carcinoma. None of the 1,005 patients with cervicitis had cervical cancer during the period of observation, which in some cases was as long as 14 years.

EDEMA OF UNKNOWN CAUSE

To the Editor:—*A woman, aged 40, for a year has had intractable edema of the feet, legs, thighs, arms, and abdominal wall; ascites is present, also. There are no signs of pericardial or pleural fluid. The heart, an electrocardiogram, the urine, the blood urea nitrogen and glucose levels, the serum chloride, protein, albumin, and globulin levels, blood smears, and blood cell counts all are normal. Pitting on pressure is marked. The edema is severe enough to make ambulation difficult, and the patient has gained 35 lb. (15.9 kg.) in weight. There have been several remissions of the edema, but none that I could attribute to therapy. There are several abscessed teeth. Both breasts on palpation reveal apparently benign cysts, which have been present for about five months. One year ago, a cyst was removed, which was pathologically benign. The thyroid has several nodules 0.5 to 1 in. in diameter (20 years ago an adenoma was removed). There are no signs of thyroid toxicity. Two years ago, a cholecystectomy was done because of stones. Recovery has been good, and the patient is not on a restricted diet. A hysterectomy was done four years ago because of severe backache attributed to uterine fibroids; two moderately sized fibroids were found on operation. Mild postoperative menopausal symptoms were easily controlled with estrogens. No estrogen has been given in a year. Another peculiar condition is a localized area on each arm above the elbow, involving several square inches, of increased hair growth. Another physician administered thyroid without effect. I have given large doses of thiamine subcutaneously and mercurial diuretics subcutaneously, without effect. I attempted to give cortisone orally, but the first dose caused dizziness, and I stopped it. On the basis of the meager history given, do you have suggestions as to diagnosis?*

M.D., New York.

Answer.—The diagnosis of the disease underlying the edema in this case is difficult, since the findings reported seem to exclude cardiac, renal, hepatic, hypoalbuminemic, lymphatic, and other less common general types of edema. Scleredema might be considered, but this almost invariably involves the face, especially the eyelids, and is often associated with pleural or pericardial fluid. Furthermore, the usual prodromal symptoms of scleredema were lacking in this patient. There remain only the hormonal edemas. Of these, myxedema is probably excluded by the failure to respond to thyroid. Edema of ovarian or adrenal cortical origin may be diagnosed by careful clinical observation and urinary hormone assays for estrogens and 17-ketosteroids and other adrenal cortical hormones. The serum sodium concentration should be determined during the height of the edema and later during a remission, to detect possible dilution of sodium by retention of water due to excessive posterior pituitary antidiuretic hormone secretion. These studies are sufficiently complicated to require hospitalization in an institution equipped with research laboratories. If adrenal hormonal imbalance is indicated, a trial of cortisone treatment might be helpful; however, the diagnostic work-up should be completed first. Elephantiasis due to lymphatic obstruction rarely involves the arms, unless there has been operative destruction of lymphatic channels, and frequent spontaneous remissions would be extremely unlikely in this disease. Only a biopsy of an affected region could definitely establish this diagnosis.

SKIN PIGMENTATION IN INTERMARRIAGE

To the Editor:—*What is the pattern of inheritance of skin pigmentation in intermarriage between persons of white and Negro races? Does a colored offspring sometimes result from the mating of mixed parents who are phenotypically white?*

William R. Gabbert, M.D., Danville, Ky.

Answer.—Patterns of inheritance are usually based on the Mendelian law, but on the question of Negro-white relationship the information is meager and the opinions divergent, placing it in the field of speculation. Pearson was of the opinion that skin pigmentation inheritance does not operate under the Mendelian law but that the coloring of the offspring of this combination represents a blending. Using a more modern interpretation of the Mendelian law and the use of the color top to match colors, Davenport arrived at these conclusions: There is no pattern of inheritance of skin pigmentation. The coloring of the first generation offspring of a Negro-white mating was always different from that of the parents, lighter than the darker parent and darker than the lighter parent. The range of color in second generation (grandchildren of a Negro-white mating) for all tested persons was twice that in the first generation. The children of this crossing (mulatto-mulatto) may be either much darker or much lighter than that of the parents. Penetrance of the Negro skin color trait is not predictable for an individual child, but again, according to Davenport, if the pedigree of the parents can be established, the probable range of color among the children may be given within certain limits. Colored offspring can result from the mating of mixed parents who are phenotypically white. Lewis states, "The conclusive evidence against inheritance of skin color in humans by blending is the occurrence of important differences among children of the same parents found by both Davenport and Barnes. In the light of modern genetics human skin color can be accounted for neither by blending nor by one pair of Mendelian alleles. There are undoubtedly multiple factors, of which at least two pairs (as suggested by Davenport) may be considered of major importance. The combination of multiple factors, with an absence of dominance, is sufficient to account for the known facts, although some of the details are still obscure."

ADMINISTRATION OF IRON

To the Editor:—*In which form is iron best tolerated by the intestines? Does it cause constipation or diarrhea? Are there substances more palatable and simpler to take than hydrochloric acid in the treatment of some anemias?*

M.D., California.

This inquiry was referred to two consultants, whose respective replies follow.—Ed.

Answer.—The most readily assimilable form of iron is ferrous iron, the ferric being less soluble and absorbable. Ascorbic acid will convert ferric iron of food into ferrous iron; consequently it is of value in promoting iron absorption. The rationale behind the use of hydrochloric acid to improve the absorption of food iron is based on the increased solubility of ferric iron in an acid medium. Hydrochloric acid is often used along with specific therapy in the treatment of pernicious anemia, but its effectiveness has not been established. Hydrochloric acid is usually diluted in water and taken through a straw. It is also available in capsule forms, such as glutamic acid hydrochloride and betaine hydrochloride. These solid preparations slowly release hydrochloric acid when in solution. The most widely used preparation of iron is ferrous sulfate, usually administered in 300 mg. doses after meals and on retiring. Colloidal ferric hydroxide is probably less irritating, the average dose being 100 mg. three times a day between meals; however, since iron must be converted to the ferrous form before absorption, any preparation, if effective, is potentially irritating. It is advisable to give small doses during the first few days of therapy to minimize the local irritant action. Moderate doses of iron preparations do not cause constipation or diarrhea except in persons unusually sensitive to the local irritant action.

Answer.—Any ionized form of iron is a protein precipitant and, therefore, irritating to the mucosa of the gastrointestinal tract. Since all available data indicate that only ionized iron is absorbed, it is evident that intestinal irritation by therapeutically effective forms of iron can only be minimized, not avoided altogether. This can be accomplished best by administering the iron after meals, by giving the patient a chance to develop tolerance to iron, and by using doses no larger than are necessary for maximum therapeutic effect. The soluble, simple ferrous salts are most efficiently absorbed and can, consequently, be given in the smallest amount. Many patients, for reasons not understood, can tolerate ferrous gluconate or ferrous glutamate better than ferrous sulfate, although the reverse may also be observed. Tolerance to iron preparations

also develops in many persons. For this reason, it is often wise to begin therapy by having the patient take only one tablet after dinner for several days, then one tablet after each of two meals for several days, gradually increasing the dose thereafter, until the full therapeutic dose of three to four tablets (containing roughly 180 to 240 mg. of elemental iron) has been reached. Even if this regimen is followed and several different iron salts are tried, rarely a patient still experiences so much gastrointestinal distress that he finds iron therapy intolerable. In these exceptional cases, it may be necessary to administer iron parenterally, i. e., as saccharated iron oxide. Iron therapy may cause either diarrhea or constipation. The reason for this difference in response to the irritating effect is not known. Hydrochloric acid is of little importance in the treatment of anemias. Its administration does not improve the response to hematinic agents. Occasionally, a patient with achlorhydria may have mild diarrhea or abdominal discomfort, which does improve when hydrochloric acid is given with meals. Many anemia clinics have adopted the policy of treating patients without the use of hydrochloric acid, and then, when the hematological response is complete, the dilute acid is given for one to two months. The patient himself judges whether the added acid has made him feel better; if so, he is permitted to continue its use. There are several commercial preparations of glutamic acid hydrochloride in capsule form that may be used as substitutes for dilute hydrochloric acid.

ANDROGEN THERAPY OF OVARIAN CANCER

To the Editor:—*In discussion of a case of papillary serous cystadenocarcinoma of the ovary by the tumor board of a hospital, the question arose of what the experience has been with the use of testosterone in treatment of this disease. I will appreciate any information you may be able to give on this subject.* *F. R. Moore, M.D., Newport, R. I.*

Answer.—While it would be correct to say that there would be no rationale in androgen therapy for serous papillary cystadenocarcinoma of the ovary or other types of ovarian cancer, such a statement would not be a satisfactory answer, since there is little rationale for the palliative use of the male sex hormones in advanced mammary carcinoma with bony metastases or estrogens in prostatic cancer, although both these plans have yielded excellent results. Scattered efforts at testosterone therapy for both genital tract cancer and ovarian malignant disease have been made, but with no evidence of worthwhile effect. In a recent case of advanced ovarian cancer with peritoneal metastasis observed by this consultant, testosterone had been given in large doses, with extensive masculinization changes resulting, but the patient and her family felt that the growth had been accelerated rather than retarded.

ARSENIC IN THE URINE

To the Editor:—*A man has lost weight, from 160 lb. (72.6 kg.) to 128 lb. (58.1 kg.), over the past two and one-half years. He has no symptoms other than loss of strength and weight, with no desire for food. Results of neurological and physical examinations were normal, except for the lack of muscular strength. X-ray and laboratory examinations were of no aid, except for a test showing fractional amounts of arsenic in the urine. The patient has never received any drug containing arsenic, but tests on the water supply from his local well were positive for arsenic. The water from this well was cut off three years ago, and the deeper well water contains none of this mineral. After one week of dimercaprol (BAL) therapy the urine shows four times the previous amount of arsenic. Is arsenic accumulated in the body from water intake over a period of many years, and may this be accepted as a case of arsenic poison?*

Barnwell R. Baker, M.D., Biltmore, N. C.

Answer.—The description given does not point necessarily to arsenic poisoning, although the loss of weight, strength, and appetite is consonant with the usual features of chronic arsenic poisoning. The quantity of arsenic in the urine and in the water supply would need to be known. Traces of arsenic are always present in urine, and the presence of traces of arsenic in drinking water is not unusual and is without significance. It is observed that the suspected source of arsenic was eliminated three years ago but that arsenic is found in the urine at present. This would make arsenic poisoning from the water supply an unlikely prospect. While arsenic is long retained and slowly eliminated from the body, about 140 days after the last exposure represents the upper limit of retention, and it is scarcely conceivable that it would persist for as long as three years. In the usual low grade chronic arsenic poisoning, skin disturbances dominate the picture, with or without loss of hair and nails. In this instance, it would be desirable to determine the arsenic content of clipped hair and, possibly, finger and toenail trimmings. The determination of arsenic in human tissues or excretions is difficult. Few laboratories have the equipment and experience necessary to provide exact determinations. If, from repeated examinations, harmful levels of arsenic should be demonstrated, this entire matter should be explored fully and a search made for possible exposure sources.

EOSINOPHILS AND CORTISONE

To the Editor:—*What explanation is given for the increase in eosinophils in a patient with sarcoidosis treated by cortisone acetate? Herpes zoster, according to the literature, is helped at times by cortisone or corticotropin. I was in contact with two patients in whom herpes zoster developed while taking cortisone acetate and one in whom it developed while taking corticotropin. What is the explanation for this?*

Joe C. Gilbert, M.D., Lebanon, Pa.

Answer.—No satisfactory explanation can be offered at this time to account for the increased circulating eosinophils after cortisone administration in a patient with sarcoidosis. In the past it was thought that the lack of eosinopenic response indicated insufficient biological action of the hormone; however, it is now known that eosinopenia is not as regularly observed after cortisone administration as after corticotropin administration. If this patient had been treated with corticotropin, a rise in eosinophils could be explained on the basis of allergic hypersensitivity to the corticotropin preparation used. This consultant also has noted on several occasions the occurrence of herpes zoster during cortisone or corticotropin therapy, but in these cases there was surprisingly little associated pain. One might postulate a disturbance in the antibody-virus relationship from these hormones that would allow otherwise neutralized or latent virus to gain the upper hand and produce clinically evident disease. Except for possible amelioration of pain, it is doubtful that these hormones exert any beneficial effect in this disease.

ACTINOMYCOSIS

To the Editor:—*Last week a patient was referred to me with an axillary lesion, which, after a biopsy and culture was shown to be a lesion of actinomycosis. It bled freely when I removed part of it, and I wore no gloves. To stop the bleeding, I had to use several sutures, and I put on gloves at the last. What chance is there that I will contract this disease? What preventive measures should I take? Has any treatment supplanted use of roentgen irradiation and the antibiotics for this disease?* *M.D., Alabama.*

Answer.—There are only a few classic cases in the world literature in which actinomycosis has been known to be transferred accidentally from man to man. It is such a remote possibility in your case that you may rest assured that you did not become infected during your surgical manipulations. The fact that you did not mention having broken areas of skin on your hands is further evidence against such an unlikely possibility. Penicillin and other antibiotics, such as aureomycin and oxytetracycline (Terramycin), are the drugs of choice in the treatment both of local cutaneous manifestations of actinomycosis and systemic involvement. Roentgen irradiation and the use of iodides have been found to be unnecessary adjuncts for successful end results in cases in which the antibiotics are administered.

ROSEOLA INFANTUM

To the Editor:—*I have understood the term "three day measles" to apply to the typical rose rash of infants (roseola infantum), as a disease entity peculiar to infants and not related to either true measles or rubella. I hear the term applied frequently to numerous rashes in adults. Is the occurrence of roseola infantum possible or common in adults?*

M.D., Indiana.

This inquiry was referred to two consultants, whose respective replies follow.—Ed.

Answer.—Roseola infantum is a definite but benign disease of infants and children. It is doubtful that it ever occurs in adults. It is considered a separate and distinct disease from German measles and is known by such names as exanthema subitum and Zahorsky's disease. It has been transmitted from one child to another by means of injection of blood. In roseola infantum, the child has fever for three to five days, and, as the fever is subsiding or within 12 hours after it has subsided, the measles-like rash appears.

Answer.—The term "three day measles" is often applied loosely by the mothers of children who may have had any one of a variety of skin rashes accompanied by mild or no constitutional symptoms. As the name implies, roseola infantum is a disease of infants and young children, principally between the ages of 6 months and 3 years. It has been estimated (Zahorsky) that fully 95% of cases occur in children younger than 2½ years. Few cases have been reported in adults. In large outpatient departments, physicians generally assume a history of "three day measles" to mean rubella.

PREGNANCY IN WOMAN WITH DOUBLE CERVIX

To the Editor:—*A 20-year-old primigravida has two complete cervices, only one of which shows signs of pregnancy. She is nearing the end of the first trimester and has had no bleeding. No bicornate uterus can be palpated. Should this patient be given a chance to deliver her baby vaginally? She has a normal gynecoid pelvis. If she has a single uterine cavity with a double cervical os, should the septum be clipped when effacement is complete and dilatation of the cervix is under way? What are the chances of the uterus' rupturing if it is septate?*

William R. Cotner, M.D., Salina, Kan.

Answer.—Although there may be a lack of fusion of any part of the Mullerian ducts, resulting in any degree of duplication of the uterus and vagina, a double cervix owing to a cervical septum is rare. In all likelihood the septum extends the length of the uterus, or there may be two complete uterine horns. The extent of the defect can be visualized only by hysterosalpingography. Labor can be allowed to proceed naturally. It is not likely that the septum will impede the effacement and dilatation. If the septum is limited to the cervix and does prevent complete dilatation it can be cut. Breech presentation is exceedingly common in women who have uterine anomalies. The baby has been known to straddle a cervical septum, and if this occurs it should be cut early before it is forcibly torn. There is almost no likelihood of uterine rupture because of a septate uterus.

TREATMENT OF PSORIASIS

To the Editor:—*A patient has a severe case of psoriasis, affecting the whole body, except the inside of the arms and the chest. I understand that treatment with Bucky rays has been successful, especially in America. I have been told, however, that in severe cases there is danger of burning internal parts of the body, and that the application of Bucky rays is, therefore, inadvisable. I should be glad if you would let me have your views on this matter.*

M. Lerner, M.D., London, England.

Answer.—The value of Bucky or grenz rays in the treatment of skin diseases is still being debated, and, although some dermatologists advocate treating psoriasis with such rays, it is generally held that destructive rays of any type should not be used for the treatment of a skin disease that, like psoriasis, is apt to recur. Grenz rays, being long wavelength roentgen rays, are absorbed in the epidermis and dermis, so that there is no danger of their burning internal parts, but sequelae, such as those produced by roentgen rays, have been observed in the skin. As a rule it is better to treat severe psoriasis with bland preparations, such as are used for acute dermatitis, since stronger preparations are likely to produce psoriatic exfoliative dermatitis. When the acute stage has subsided, it may be advisable to employ the so-called Goeckerman treatment, in which a combination of coal tar ointment and ultraviolet rays is used. Sometimes autohemotherapy is employed with it. It is a treatment that requires both experience and judgment to be effective.

CLINICAL NEUROSYPHILIS

To the Editor:—*What period of time usually elapses between the appearance of the primary syphilitic lesion and the manifestation of clinical neurosyphilis? Has the number of paretic persons admitted to mental hospitals diminished since the drop in the incidence of syphilis, or is it too early for such a result to be felt?*

J. W. O'Neill, M.D., White Cloud, Mich.

Answer.—This question cannot be answered with regard to clinical neurosyphilis as an entity but only with regard to particular types of neurosyphilis and then only in general terms. Acute syphilitic meningitis is a common accompaniment of secondary syphilis. It may even occur with the primary lesion and before the appearance of secondary symptoms and almost always appears within the first two years of infection. For other clinical types of late neurosyphilis the average incubation period varies. For diffuse meningovascular syphilis, it is probably about 6 to 10 years, for dementia paralytica (general paralysis of the insane) about 12 to 15 years, and for tabes dorsalis about 15 to 20 years. There are, however, exceptions to these statements. Any form of neurosyphilis may, in rare cases, appear within two or three years of infection. On the other hand, the appearance of clinical signs may be delayed for 30, 40, or 50 years. The number of paretic persons admitted to mental hospitals has been dropping steadily since about 1939 (Moore, J. E.: *Am. J. Syph.* **35**:101, 1951).

ENDOMETRIOSIS AND STERILITY

To the Editor:—*What are the recent therapeutic developments in the management of sterility as a result of endometriosis?* *C. H. Denser, M.D., Chatahoochee, Fla.*

Answer.—No new therapy has been discovered that alters much the infertility of women with endometriosis. Some women with endometriosis have pregnancies. There are many factors involved in infertility problems, only one of which is endometriosis. It is not known why patients with this condition seem less fertile than others; only speculation is possible. Estrogens given in adequate amounts (the amount differs according to the patient) relieves the symptoms of endometriosis in most instances. Some believe estrogens have some curative value in the disease. It is likely that the relief of symptoms is the result of the stopping of ovulation by the estrogens. The amounts of estrogens required to accomplish this often are high. There are reports of patients receiving estrogenic substances having conceived. It seems unlikely that patients receiving adequate amounts to relieve the symptoms of endometriosis would become pregnant. Certainly, if amounts high enough to stop ovulation were administered pregnancy could not occur. Surgical treatment seems to help some patients to conceive, but in most cases this is true only early in the disease. The difficult problem is to pick the patients suitable for surgical treatment. In most cases the disease appears more extensive at surgery than was predicted preoperatively, and often the disease so thoroughly involves the pelvic structures that, if properly removed, the remaining organs would be inadequate for pregnancy.

DISINFECTION AGAINST TAPEWORM OVA

To the Editor:—*I would like information on the susceptibility of tapeworm ova, especially of the genus Taenia, to various agents, such as chemicals and heat, that might be used to rid perishable materials of these parasites.*

W. O. Brown, M.D., Scottsbluff, Neb.

Answer.—It is not clear whether by "perishable materials" the inquirer means food that is to be consumed uncooked and whether by "susceptibility of tapeworm ova to chemicals and heat" he means the disinfecting of fecal discharges containing these ova or the rendering of garbage safe for animal food. A summary of information found in a rather exhaustive search follows: Burning or drying is the safest method of disinfecting feces. Boiling will also destroy the ova. Burial is practicable and, if a well is on the premises, should be at least 500 ft. from the well and downhill from it. It should be buried in the upper 2 ft. of soil to protect underground water and to take advantage of natural agencies of purification. The burial spot should not be cultivated for 12 months. For chemical treatment of infected feces, Stiles advises the addition of sufficient sodium hydroxide to make a 3% solution. This will kill hookworm ova in eight to nine days under summer conditions. Taenia eggs with their hard shells will be attacked more slowly. The best method is some septic tank process, as anaerobic fermentation destroys the eggs. Hookworm eggs die in 40 days. Taenia ova require a longer period.

Faust states, "Taenia eggs are very resistant to external conditions. Jepson and Roth of Copenhagen found that they could infect cattle with eggs of T. saginata which had been in excreta for 71 days, free in water for 33 days and free on grass for 159 days. Likewise Newton, Bennett and Figgat (NIH) found that these eggs were apparently 100% viable up to 162 days in activated sludge." Hogs can be fed safely on boiled garbage.

MYOCARDIAL INFARCTION

To the Editor:—*Is the prognosis better in a patient who has had a myocardial infarction and whose electrocardiogram returns to normal than in one whose tracing remains abnormal after clinical recovery, all other factors being equal? Are posterior myocardial infarctions more likely to result in persistent electrocardiographic changes following recovery than are those involving other regions of the ventricular muscle?*

M.D., Pennsylvania.

Answer.—Among patients thought to have had myocardial infarctions whose electrocardiograms later returned to normal, there are likely to be some persons who actually have had some more benign malady, such as pericarditis. It may be suspected, therefore, that prognosis in such a group would be somewhat better than in one that included only persons with persistent QRS changes diagnostic of myocardial destruction. There seem, however, to be no statistical studies to settle the question. Posterior myocardial infarctions are no more likely to show persistent electrocardiographic abnormalities than lesions in other portions of the heart.

SHOULD THE MOTHER NURSE ERYTHROBLASTOTIC BABIES

To the Editor:—*A woman, aged 30, now para 1, gravida 3, who is approaching term, is Rh negative, and her husband is Rh positive. At 34th week of pregnancy, this woman's blood revealed no Rh antibodies. Her first pregnancy was terminated by illegal abortion in the 10th week. The second pregnancy went to term, with spontaneous delivery. The child, now 3, is strong and healthy. Should the mother be permitted to nurse the expected infant? Is it possible for Rh antibodies to be present in the milk of the nursing mother, although not in her blood?* *M.D., New York.*

Answer.—Since in the case described the expectant mother's serum contains no Rh antibodies, the possibility of erythroblastastosis in the infant is excluded (barring sensitization to other blood factors), unless Rh antibodies should appear during the last few weeks of pregnancy. Rh antibodies are never present in the milk when absent from the blood, so that if the mother's serum contains no Rh antibodies, there can be no objection to permitting her to nurse the infant. In fact, experience has shown that there is no harm in permitting erythroblastotic babies of sensitized Rh-negative women to nurse. Apparently, the additional quantity of antibodies that might be ingested and absorbed is so insignificant that it does not aggravate the disease process. In England, erythroblastotic babies are routinely permitted to nurse, since it is considered that the advantages of nursing far outweigh the theoretical dangers of any Rh antibodies the milk may contain.

DEMONSTRATION OF SICKLE CELLS

To the Editor:—*A Negro woman was suspected of having sickle cell anemia. I placed a drop of her blood on a slide, covered it with a coverslip, and sealed it with petroleum jelly. Eight hours later I looked at the slide under the microscope. A white corpuscle was filled with rapidly moving particles, about the size of those you would expect to see in a granulocyte. Is this phenomenon to be expected in sickle cell anemia?* *M.D., Pennsylvania.*

Answer.—The phenomenon of the rapidly moving particles probably is due to Brownian movement of suspended particles in wet preparations and is not of clinical significance. In regard to the sickle cell test, placing a drop of blood on a slide, applying a coverslip, and then sealing with paraffin is an outdated method. It is now well established that sickling is caused by the almost complete insolubility of the reduced pathological sickle cell hemoglobin within the cells. Sickling will only occur if this pathological pigment is sufficiently deoxygenated. Reduction of hemoglobin without damage to the cell is best achieved by adding two drops of a freshly prepared 2% solution of sodium metabisulfite ($Na_2S_2O_5$) to one drop of blood and then covering the mixture with a coverslip. After 5 to 15 minutes the sickled cells are readily demonstrable.

ANTIBIOTICS

To the Editor:—*At a recent postgraduate course, the lecturer stated that only penicillin and streptomycin were bactericidal and that all the other antibiotics, such as aureomycin and oxytetracycline (Terramycin), and also the sulfonamides were bacteriostatic. Please comment on this subject.* *M.D., New Jersey.*

Answer.—All antibiotics and commonly used sulfonamides are bactericidal in vitro against certain strains of micro-organisms, if present in high enough concentrations. What the lecturer meant was that in certain types of infections, produced by susceptible strains of organisms, penicillin or streptomycin may be bactericidal in the concentrations of the antibiotic obtained in the blood of the patient, by standard methods of therapy. As a rule of thumb, it is better for the physician to assume that the action of the antibiotic he is employing will be bacteriostatic. This is the effect that will be obtained in the majority of patients.

PAIN IN ARM ASSOCIATED WITH BOWEL MOVEMENTS

To the Editor:—*I have seen a few patients who have a neuralgic type of pain in the left arm while having a bowel movement. I saw two patients with anal inflammatory lesions (fissure and cryptitis) complaining mildly of the same pain. Is this a definite reflex entity or just a happenstance?*

Glenn A. Hopkins, M.D., Guymon, Okla.

Answer.—There are no reflex connections that could account for neuralgic pain in the arm occurring in association with a bowel movement or with an anal lesion. Straining to move the bowels may aggravate or precipitate pain in the arm from an intraspinal lesion, such as a spinal cord tumor or a herniated cervical intervertebral disc. Whether such an intraspinal lesion is present in these patients would be impossible to say without a more complete examination.